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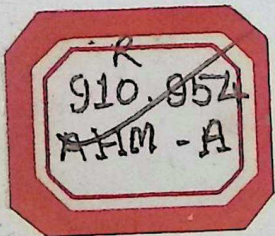
Abstracts of Research Papers
on

THE GEOGRAPHY OF INDIA
1982-1987

Compiled and edited by

AIJAZUDDIN AHMAD and MOONIS RAZA

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Presented to
The 26th International Geographical Congress
Sydney, August 21-26
1988

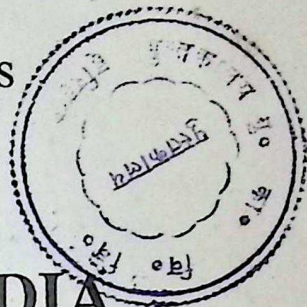
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गुरुकुल कांगड़ी विश्वविद्यालय
विषय संख्या _____ आगत नं० _____
लेखक Ahmad Aijazuddin & Raza
शीर्षक Abstracts of Research Papers on the Geography of India. 1982-87

दिनांक	सदस्य संख्या	दिनांक	सदस्य संख्या

गुरुकुल कांगड़ी विश्वविद्यालय, हरिद्वार
कृपया पुस्तक के ऊपर कोई निशान आदि
न लगायें।

Abstracts of Research Papers
on
THE GEOGRAPHY OF INDIA
1982-1987



Compiled and edited by
AIJAZUDDIN AHMED and MOONIS RAZA

Presented to
The 26th International Geographical Congress
Sydney, August 21-26, 1988

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ACKNOWLEDGEMENT

The Editors and the Chairman of the National Committee for Geography place on record then deep appreciation and sincere thanks to the following faculty colleagues and research scholars who helped in the preparation of the abstracts of papers included in these Reports. Particular thanks are due to Mr. Sachidanand Sinha and Mrs. Nasim Aijaz who shared with us the drudgery and the excitement of the editorial work, although we know, despite our best efforts, the work is not up to the mark.

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We thank all of them individually for their cooperation in this venture.

New Delhi

10th August, 1988

Aijazuddin Ahmad

Moonis Raza

Editors

Subject-wise Classification of Papers Abstracted

A. Historical Geography

- A-1 General
- A-2 Pre and Proto-historic
- A-3 Ancient
- A-4 Medieval
- A-5 Modern
- A-6 Contemporary Economic and Social History

B. Political Geography

- B-1 General
- B-2 International Relations
- B-3 Centre-State relations: Geography of Federalism
- B-4 Electoral Geography
- B-5 Administrative Geography
- B-6 Political Geography of Regionalism

C. Social Geography and Cultural Geography

- C-1 General
- C-2 Race
- C-3 Tribe
- C-4 Language, Dialect
- C-5 Caste
- C-6 Religion
- C-7 Social Change, Modernization
- C-8 Social Infrastructure: Health
- C-9 Social Infrastructure: Education
- C-10 Cultural Correlates
- C-11 Social Pathology, Social Well-Being, Social Stress
- C-12 Social Amenities: General
- C-13 Gender: Women Studies

D. Economic Geography

- D-1 General
- D-2 Economic Development
- D-3 Inter-sectoral Relationship
- D-4 Economic Infrastructure: Irrigation and Power

- D-5 Economic Infrastructure: Institutional Credit and Banking
- D-6 Geography of Tourism, Recreation, Leisure
- D-7 Labour Force, Employment
- E. Agricultural Geography**
 - E-1 General
 - E-2 Land Use, Cropping Pattern, Distribution of Crops
 - E-3 Agricultural Efficiency, Agricultural Productivity, Agricultural Development
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 - E-5 Agricultural Typology
 - E-6 Horticulture, Dairy Farming
 - E-7 Environmental Basis of Agriculture, Ecological Consequences
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 - E-9 Technological Factors, Agricultural Extension and Communications
 - E-10 Input-Output Relationship
 - E-11 Food Systems Studies
- F. Industrial Geography**
 - F-1 General
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- G. Geography of Marketing, Transport and Communications**
 - G-1 General
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 - G-5 Trade Centres: Ports
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- I-4 Morphology, Land Use Studies
- I-5 Social and Economic Characteristics
- I-6 Central Places: Hierarchy of Settlements
- I-7 House Types
- I-8 Quality of Life

J. Settlements: Urban

- J-1 General
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- J-3 Evolution and Growth of Urban Centres
- J-4 Distribution Pattern of Cities: Urban Systems
- J-5 Morphology and Urban Land Use
- J-6 Economic, Social and Demographic Structure
- J-7 City Region
- J-8 Functional Classification, Urban Hierarchy, Central Places
- J-9 Urban Planning and Urban Development
- J-10 Quality of Life Indicators: Urban Poverty, Slums

K. Regional Geography

- K-1 Approaches to Regionalisation
- K-2 General
- K-3 Himalaya
- K-4 North Indian Plain
- K-5 Peninsular Plateau
- K-6 Coastal Plains and Islands
- K-7 The Indian Ocean Realm

L. Regionalisation and Regional Development Planning

- L-1 Approaches to Regionalisation
- L-2 Hierarchy of Planning Regions: Macro, Meso and Micro-Level Planning
- L-3 Comprehensive Planning: Integrated Area Planning
- L-4 Regional Development: Theoretical Framework Concepts and Strategies
- L-5 Levels of Regional Development: Measurement of Regional Disparities
- L-6 Rural and Urban Development
- L-7 Rural-Urban Interaction: Diffusion of Innovations

M. Professional Issues in Geography

N. Education in Geography

- O-1 Theoretical Geography
- O-2 Philosophical Issues in Geography
- O-3 Evolution of Geographical Thought
- O-4 Contemporary Issues, Ideology and the Question of Social Relevance
- O-5 Contemporary Trends in Geographical Thought

P. Environmental Studies

- P-1 General
- P-2 Ecosystems, Ecological Balance, Environmental Degradation
- P-3 Natural Resources and Development
- P-4 Ecological Consequences of Development
- P-5 Environmental Impact Studies
- P-6 Natural Hazards

Q. Geomorphology

- Q-1 General Geomorphology
- Q-2 Morphometric Analysis : Quantitative Geomorphology
- Q-3 Fluvial Geomorphology : Drainage Basin Studies
- Q-4 Cycle of Erosion : Erosional Surfaces
- Q-5 Applied Geomorphology
- Q-6 Coastal Geomorphology
- Q-7 Glaciation Studies

R. Hydrology

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- S-1 General
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- S-3 Comparative Climatology
- S-4 Climatic Regions and Regionalisation
- S-5 Indian Monsoon
- S-6 Climatic Change Studies
- S-7 Applied Climatology

T. Soil Geography

U. Biogeography

- U-1 General
- U-2 Geography of Plants
- U-3 Geography of Animals
- U-4 Man and the Biosphere Studies

V. Oceanography

- V-1 General
- V-2 Sub-marine Relief and Ocean Deposits
- V-3 Physical and Chemical Properties of Ocean Waters
- V-4 Movements of Ocean Waters
- V-5 Marine Resources

W. Methods

- W-1 General
- W-2 Quantitative Methods
- W-3 Cartographic Methods
- W-4 Remote Sensing and Areal Photo Interpretation Techniques
- W-5 Field Work Methods

X. Behavioural Geography

- X-1 General
- X-2 Mental Images and Perception Studies

LIST OF JOURNALS CITED

Annals of Avid Zone, Jodhpur
 Annals of the Association of Rajasthan Geographers, Jaipur
 Annals of the National Association of Geographers, India, Pune
 Artha Vijanana
 Bhu Vigyan (in Hindi)
 CSRD, Occasional Papers, JNU, New Delhi
 Deccan Geographer, Secunderabad
 Demography India, New Delhi
 Discussion Papers, Syracuse
 Geographical Bulletin of India, Patna
 Geographical Review of India, Calcutta
 Geo-Journal, West Germany
 Hill Geographer, Shillong
 Indian Geographical Journal, Madras
 Indian Geographical Studies, Patna
 Indian Journal of Agricultural Economics
 Indian Journal of Landscape Systems and Ecological Studies
 Indian Journal of Regional Science, Kharagpur
 Indian Journal of Social Work
 Journal of Geological Society of India
 Journal of Geomorphology
 Journal of Educational Planning and Administration, New Delhi
 Journal of Himalayan Studies and Regional Development, Srinagar, Garhwal
 Journal of the Indian Society of Soil-Science
 Journal of Rural Development
 Journal of Tropical Geography, Singapore
 Man in India, Ranchi
 National Geographer, Allahabad
 National Geographical Journal of India, Varanasi
 Philippine Geographical Journal, Manila
 Photo Nirvachak, Dehra Dun
 Political Geography Quarterly
 Population Geography, Chandigarh
 Professional Geographer, Washington D. C.
 Research Papers, Chicago University
 The Geographer, Aligarh
 The Geographical Observer, Meerut
 Transactions, Institute of Indian Geographers, Pune
 Vayu Mandal, New Delhi.

PREFACE

This Country Report on India presents abstracts of a sample of several hundred research papers published on Indian geography during the period 1982-87. These papers have been purely randomly chosen and no criteria were applied in their selection. The Report, therefore, does not claim to be exhaustive in its coverage. The omission or inclusion of any paper in the Report does not reflect on its quality in any manner whatsoever. The authors of these papers include both young, researchers young in age and experience as well as seasoned scholars whose names are familiar to the international community of geographers. These papers were picked up from the Indian journals of geography published during 1982-1987 as well as from the journals of other allied disciplines such as regional science, population studies, rural economics and development, area studies, geomorphology, meteorology, soil science and environmental studies. While research published mostly in journals has been included in this collection, other research publications such as collections of papers, monographs, occasional research papers have also been included wherever possible. Although a few foreign publications have also figured in the Report, the intention was to concentrate on research published in Indian journals only.

The Report presents glimpses of the state of geographical research in India with all its methodological nuances, choice of themes, regional biases and intellectual moorings. These abstracts present an Indian sample which is a mix of different levels of research.

It may be of some interest to the reader to present an overview of research done on the various aspects of geography of India as reported here. Six years' time is not a short period to discuss such trends. In fact, the research interests of Indian geographers as reflected to this sample do point to a direction.

British influences during the formative period notwithstanding, Indian geography, today seems to be moving closer to the U.S. academia. This is evident from the fact that the Indian specificity is quite often lost in an international generalism which is an outcome of the uncritical acceptance of the models and the theoretical constructs developed in the West, more particularly in the U.S.A. This is also evident from the fact that the social and economic fields have pushed physical geography to relative insignificance. Less than one-fourth of the research effort has gone into physical geography which continues to be a neglected field. On the human side, regional development, agriculture and urban studies have accumulated to eclipse the other sub-fields. Issues of a theoretical

and methodological nature do not seem to arouse much research interest. Whatever passes in the name of theory under the prevailing climate of empiricism is so anemic that it does not give birth to genuine debates on real issues in theory. Research on indicators of social well-being and the ecological consequences of economic development continues to be neglected.

Research contributions on India as the aggregative regional entity have been more numerous than on any of the component states individually. Among the states of the Indian Union, U.P. and West Bengal are by far the most researched-upon states, a phenomenon to be seen in the context of the general development of geography as a curricular subject in these two states. The states of Maharashtra, Bihar and Andhra Pradesh follow limply. The states of Assam, Haryana, Himachal Pradesh, Kerala, Karnataka, Punjab, Orissa and Meghalaya have failed to figure significantly.

It is hoped that this sample of papers abstracted in the Report will help promote an understanding of the state of the art in India both among the foreign observers of India as well as among the Indians to whom the Report offers an opportunity to discover the areas of strength and weakness in their own research endeavours.

(Aijazuddin Ahmad)

Part I

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1982 : Part I

A. HISTORICAL GEOGRAPHY

A-3 : 1

MINATI SINGH, Distribution of Buddhist Settlements in Lower Ganga-Ghaghra Doab, *Man in India*, Vol. LXII, No. 2, 1982, pp. 191-194.

The present paper describes the distribution of Buddhist settlements in the Lower Ganga-Ghaghara Doab, comprising the districts of Azamgarh, Ballia and Ghazipur.

It seems that the Buddhist period was marked by well-organised communities who were living in compact settlements mostly along the water fronts and accommodating between 30 to 1000 families. The unit of settlement was the *griha* (house). The process of settling, no doubt, had involved a long drawn period of time on land reclaimed through forest clearings. It is interesting to note the existence of 'professional villages' inhabited by the people of one and the same profession. Often the built-up area was surrounded by agricultural plots. The intermediary rudimentary centres, like the modern market villages, were quite few and far between. The general pattern was such that every village enjoyed more or less a self-contained status with its own professional artisans and craftsmen dependent on the population of the cultivators.

A-3 : 2

M.P. TRIPATHI, Mountaineering in Ancient India, *National Geographer*, Vol. XVII, No. 1, 1982, pp. 69-73.

The present paper gives an account of mountaineering in ancient India. Right from the Vedic times to the Mahabharata period ancient Indians had developed a tradition to tread and trek the Himalayas.

During this period, they had discovered with considerable accuracy the sources of Sindhu and its affluent rivers as well as the Ganga, Yamuna and the Brahmaputra. It is possible to trace evidence in the Mahabharata which reflects an intimate knowledge of the geographical divisions of the Himalayas. It was generally believed that the Himalayas were divided into outer, lesser and

interior ranges. Kalidasa's writings reveal that he had profound knowledge of the Himalayas. Panini (700 B.C.) had referred to special arteries of communication in the mountains. Puranas meticulously classified the world mountains into (1) central mountains, (2) sub-adjacent mountains (3) sub-continental ranges (4) principal chains (5) boundary mountains and (6) filament mountain. They possessed very accurate knowledge of mountain systems of India. This must have been accomplished by the amateur as well as professional mountaineers. Devibhagwat says that Indians carried military expeditions at a height of nearly 3,350 m. above sea-level. Jainas possessed scientific knowledge of the geography of urban centres in the mountains, as discussed in the work Dugvija of the 4th century A.D. Buddhists, in their Mahanid-desha (400 to 200 B.C.) have furnished exceptionally enthusiastic and graphic account of the two ancient mountaineers. In their expeditions ancient Indians developed mountain roads and paths.

C. SOCIAL GEOGRAPHY AND ANTHROPOGEOGRAPHY

C-4 : 3

M.ISHTIAQ, Linguistic Mobility Among the Santals of the Chhotanagpur Region of Bihar, *National Geographer*, Vol. XVII, No. 1, 1982, pp. 59-68, 2 Tables, 1 Map.

In the present paper linguistic mobility among the Santals of the Chhotanagpur region has been discussed.

The Santals of the Chhotanagpur Plateau use several languages/dialects which belong to different linguistic families of the country. Over the years an important change came in their use of language/dialect which is an outcome of the process of interaction which was due to the process of assimilation through the expansion of urbanisation. The shifting of work-force from primary to non-primary sector of economy and growth of literacy further contributed to it. The linguistic change is markedly found among those who have been in contact with other linguistic groups mostly on the peripheral areas. On the other hand it is much restricted in the core areas of the tribal concentration, where the tribals continue to be affiliated to their traditional dialects. Thus the change is spatially uneven.

C-8 : 4

WILFORD A. BLADEN AND P.P. KARAN, Air Pollution and Health in Bombay, *National Geographer*, Vol. XVII, No. 1, 1982, pp. 1-4.

Many of the effects of air pollution, though evident are difficult to quantify or evaluate. In the present paper, the authors have selected to explore one aspect, i.e., the relationship between air pollution and morbidity or mortality due to respiratory diseases taking the case study of Bombay.

The authors have found a positive correlation between hospital admissions for acute respiratory illness and air pollution level; the amount of hydrocarbon compounds present in the air. The analysis focusses primarily on sulphur oxides and suspended particles, with some attention being given to other pollutants mentioned above.

The relationship between hospital admission for acute respiratory illness and air pollution is seen to be more marked in the central parts of the city of Bombay with a large number of industrial establishments being located there. The high proportion of the males among those admitted to hospitals might be explained by considering smoking habits and exposure to pollutants at jobs. The marked increase between November and February is related to thermal inversions, accounting for higher pollution concentration.

C-9 : 5

D. DHANPAL AND AIJAZUDDIN AHMAD, School Provisions in Urban Delhi in a Spatial Perspective, *Indian Geographical Journal*, Vol. LVII, No. 1, 1982, pp. 24-34, 6 Diagrams, 3 Tables.

Spatial inequities in the distribution of educational services, one of the components of social-well being are observed in different parts of the world.

This paper seeks to find out whether such type of spatial disparities exist in India by taking urban Delhi as an example with emphasis on school services. Further, it seeks to find out the levels of school provisions at census charge-level by employing principal components analysis. For this purpose data for all the two thousand and odd schools have been collected. The analysis shows that there are disparities in the distribution of school services in urban Delhi.

Further, it reveals that the inner city is more advantageous than the suburbs so far as the density of schools is concerned. It is found that in terms of schools/population ratio the inner city is, however, not in that "advantageous position.

D. GENERAL ECONOMIC GEOGRAPHY

D-5 : 6

R.K. GUPTA, BIMAL KISHORE AND RAM BABU, Ecological Background of the Garhwalis : A Case Study for Environment Education and Eco-Development, *Journal of Him. Std. and Reg. Dev.* Vol. V-VI, 1981-82, pp.19-28, 4 Tables.

In this paper the ecological background of the Garhwalis based on surveys has been described.

Crop production as an income-generating activity is undertaken without investing higher capital resources. It has been found that capital is shy towards crop production. All the economic activities undertaken by the cultivators such as crop production, milk production, animal sales and off-farm jobs are full of uncertainties and inadequate since none of these farm families seem to specialise in anyone of these available occupations. The absence of complementarity between crop production and animal husbandry indicates the distorted pattern of agriculture, the poor land resource base available to the cultivators and the general lack of awareness regarding modern technology applicable to hill agriculture.

The authors are of the opinion that with increase in availability of secure occupations which are relatively free from uncertainties, crop production as an occupation may be pushed to the state of subsidiary occupation rather than being primary in the present state.

E. AGRICULTURAL GEOGRAPHY

E-1 : 7

M.HUSSAIN AND R. SAHU, Areal Concentration of Rice in Assam, *NGJI*, Vol. XXXVIII, Parts 1 and 2, 1982, pp. 19-27, 2 Tables, 5 Maps.

The present paper is an attempt to analyse the distribution pattern of the area under rice in Assam in order to find out its areal concentration. The regional dominance of rice has been determined

first by comparing the proportion of sown area and secondly, by relating the crop density in each of the component areal unit of the province to the corresponding density of the province as a whole. The latter approach helps in measuring the regional concentration of rice culture objectively and differentiates areas that have some significance with regard to its distribution within the region.

Though rice in general is the dominant crop but its cultivation in the sub-divisions of Kokarjhar and Karimganj is exceptionally extensive in which over 80 per cent of the gross cropped area is under its cultivation, in seven sub-divisions, though rice is a leading crop, but its percentage share in the total cultivated land is less than 60. In spite of almost all the favourable agroclimatic conditions and its extensive cultivation rice is not showing strikingly upward trend in productivity level.

E-1 : 8

SURENDRA SINGH, Identification and Phasing of Agricultural Development in Rohilkhand, Uttar Pradesh, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 28-36, 2 Diagrams, 3 Tables, 1 Map.

The purpose of the present paper is to portray, through a quantitatively constructed model, some of the basic regularities inherent in agricultural production. The study area is a meso-regional unit- Rohilkhand, where an intensive but non-primitive subsistence type of agriculture is practised. The scope of the investigation is confined to the optimum solution for agricultural development with the help of 'Reciprocity Model' which, resting heavily on the mathematical derivation of the potential theory, identifies the laws governing agricultural potentiality and marginal productivity. The generalised study concludes with a plea for optimum allocation of infrastructural inputs and the maximum utility of innovations according to the regional potentiality for maximized production.

E-2 : 9

M. JAHAN KHAN, Changing Patterns of Crop landuse in Eastern Uttar Pradesh (1950-51 to 1979-80), *The Geographer*, Vol. XXIX, No.1, 1982, pp. 70-75, 5 Maps.

This paper is an attempt to study the changes in the cropping pattern, that might have occurred within three decades (1950-51 to 1979-80).

For delineating the crop combinations, 'Doi's method has been adopted.

Rice holds first rank almost invariably throughout the region. During 1979-80 wheat replaced rice except in Azamgarh where barley has been replaced by rice as second ranking crop. Sugarcane replaced gram as third ranking crop. Wheat, rice and sugarcane are the main crops which have made the largest gain during the last three decades while gram, maize, barley, jowar and bajra have made the largest percentage increase. The reasons for this change have been attributed to easy availability of fertilizers, irrigation facilities and good soils.

The changes in the relative positions of strength of the selected crops has also been examined.

F. INDUSTRIAL GEOGRAPHY

F-1 : 10

S. L. KAYASTHA AND M. B. SINGH, Resources, Industrial Patterns and Planning in Eastern Uttar Pradesh, *The Indian Geographical Journal*, Vol. LVII, No. 1, 1982, pp. 35-105, 11 Tables, 2 Maps.

The present paper analyses the resource development pattern in Eastern Uttar Pradesh which is a backward region. Eastern Uttar Pradesh possesses adequate raw materials. However, it lacks in infrastructural facilities.

The authors, have discussed the industrial structure, factories and factory employment and mentioned the productive capital, in terms of rupees in millions in the study area and provided production index to give a picture of regional specialisation as well as level of industrialisation.

The authors have found out that the mineral resources of Mirzapur district, agricultural wealth of the region and the traditional skills of the local artisans offer wide scope for future industrial development.

G. GEOGRAPHY OF TRADE AND TRANSPORT

G-2 : 11

S.B. SINGH, Periodic Markets and Rural Development : A Case Study, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 86-92, 1 Diagram, 2 Maps.

In the present paper an attempt has been made through a case study of Sultanpur to analyse the distribution of periodic market centres in Sultanpur. The author has suggested some strategies to be adopted for rural development through the network of these markets. In this context, three areas have been taken from different parts of the district and it has been found that the village sites are mostly associated with the physico-cultural factors whereas market centres mostly of bigger size have developed at intersection points of roads. Further it has been observed that thiessen polygons are the best fit for the transformation of village shapes in regular polygons, as the village sites are always taken into consideration as they are.

The author has suggested that the synchronization of market days, establishment of new market centres, transformation of village shapes into thiessen polygons and hexagons to provide efficient marketing system and the provision of complementary services to the system are essential requisites for the integrated rural development of the area.

G-8 : 12

P.K. KARA, S.N. TRIPATHY, AND D.K. SINGH, A Comparative Analysis of Major Ports of India and their Traffic Characteristics, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 60-66, 1 Diagram, 4 Tables, 1 Map.

In this paper, the traffic of the major ports of India has been analysed. When evaluated by tonnage the commodity structure of these ports exhibits a strong tendency to be composed mainly of one class such as petroleum and products, iron ore, fertilizers and other raw materials; fifty per cent of traffic of most of the ports is composed of either minerals or petroleum products; almost all the ports reveal an imbalance in trade; coastal trade is much less than the foreign trade; although one type of traffic accounts for over 50 per cent of the tonnage handled, there are other commodities also present at these ports.

The major ports of India can be classified on the basis of their typology : (i) Ports associated with petroleum and its products such

as Cochin, Bombay, Calcutta; (ii) ports associated with mineral ores such as Mormagao, Visakhapatnam and Paradip; (iii) ports associated with general products such as Kandla, Mangalore and Tuticorin; and (iv) ports which perform two or more of the above functions, for example, Madras and Visakhapatnam.

H. POPULATION GEOGRAPHY

H-1 : 13

GOURI DUTTA, Analysis of Literacy Rates in the Southern Districts of West Bengal, *Geo. Rev. India*. Vol. XLIV, No. 2, 1982, pp. 19-26, 6 Tables.

In this paper an attempt has been made to find out the role of socio-economic variables in explaining the variations in literacy rates as well as in explaining the differences between the literacy rates of the males as well as of the females in the southern districts of West Bengal. The degree of urbanisation, Scheduled Castes and Tribes have been chosen as independent variables in explaining the literacy rate. The socio-economic variables for explaining the differences between male literacy and female literacy rates are the workers in the primary activities and the Scheduled Castes and Tribes. The first model explains satisfactorily the variation in the dependent variable in all the districts, whereas the second model does not give satisfactory results for all districts.

H-3 : 14

FARASAT ALI SIDDIQUI, Regional Analysis of the Sex Structure of Population of Uttar Pradesh, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 74-85, 1 Diagram, 4 Tables, 2 Maps.

The present paper attempts a regional analysis of the sex structure of population of Uttar Pradesh. The first aspect of the study deals with an assessment of the general pattern of sex ratio of population. The second aspect of the study is concerned with the identification of sex structure regions which are obtained by plotting the rank-difference correlation co-efficients of sex ratio by decennial age-groups for general population of the districts against the state average. And finally the relationships of sex structure with thirty-five selected demographic and non-demographic variables have been obtained. The overall assessment of demographic and non-

demographic variables and their associations with sex-ratio leads to the conclusion that the locational structure of population, socio-economic structure, migration and productivity are the chief determinants of sex composition of population.

The analysis of the variables reveals that three factors which explain more than 60 per cent of the total variance are socio-economic situation and urbanisation, population and unemployment.

H-4 : 15

R.N. SINGH AND SAHAB DEEN, Occupational Structure of Urban Centres of Eastern Uttar Pradesh : A Case Study of Manufacturing, *Deccan Geographer*, Vol. XX, No. 1, 1982, pp. 183-197, 2 Diagrams. 2 Tables, 2 Maps.

In this paper an attempt has been made to discuss the nature, role and importance of manufacturing industry in the urban centres of Eastern Uttar Pradesh. The characteristics of industrial workers such as male-female ratios and composition according to age-group have also been analysed. The correlation between functional specialisation and socio-economic variables has also been attempted.

H-4 : 16

APURBARABI GHOSH, Occupational Structure of Population in the Southern Districts of West Bengal, *Geog. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 40-47, 2 Diagrams, 2 Tables.

The present paper analyses the occupational structure of population of the southern districts of West Bengal based on 1971 census data. The Lorenz Curves have been constructed to show the variation. The author has found the visual comparison of areas contained by individual curves rather tedious. To achieve greater precision a numerical index has been derived from the graph itself. The derivation of the index is again handicapped by the laborious and awkward method of calculation of the area contained by the curve. Alternatively a kind of crude index has been obtained by summing the cumulative percentage for each areal unit. The author is of the opinion that the curve deserves special attention because of its visual expression and ability in calculating numerical index for comparison.

SURYA KANT, A Spatial Analysis of Structure of Rural Economy in Uttar Pradesh : 1951, NGJI, Vol. XXVIII, Parts 1 and 2, 1982, pp. 44-55, 2 Tables, 4 Maps.

The present study revealed that not only rural economy of Uttar Pradesh in 1951 was overwhelmingly agricultural but also its rural non-agricultural sector was predominantly locally oriented. Non-agricultural population which was 16 per cent of the rural population, was comprised by only one-third of workers; nearly four-fifths of them were simply providing services and goods to the local population. The corresponding figures for India were 17.33 and 66 per cent. It signified that the rural economy of the State was more agricultural and subsistence than that of the country as a whole.

Three-fourths of the locally oriented non-agricultural workers in rural areas rendered a variety of low level services and the remaining one-fourth produced goods. A significant proportion of workers in service sector was comprised by casual labourers, domestic servants, barbers, priests and retailers. A high proportion of workers in casual labour suggested that neither agriculture nor industry had the capacity to provide stable employment to these persons coming mainly, from lower castes. The production sector had workers in activities like food processing, shoe making, carpentry, blacksmithy and earthen pottery.

The entire structure reveals a self-contained traditional society at a low level of economy operating under a feudal system.

H-5 : 18

SARSWATI RAJU, Regional Patterns of Female Participation in the Labour-Force of Urban India, Professional Geographer, Vol. XXXIV, No. 1, 1982, pp. 42-49, 1 Diagram, 1 Table, 1 Map.

This paper presents a geographical analysis of the variation in female participation in the urban labour force in four Indian States: Andhra Pradesh, Madhya Pradesh, Karnataka and Uttar Pradesh. An overview of the geography of female work participation in the urban areas of these four States of India shows a gradient of decreasing female employment from south to north (21 per cent in Karnataka to 5 per cent in Uttar Pradesh). When depressed class workers, are viewed in relation to privileged class workers, depressed class female workers appear to enjoy a higher

degree of lateral occupational mobility. However, both privileged class females and depressed class females respond comparably to the social situation, that is, if the social environment is conducive to female work outside the family domain for privileged class females, it is also liberal for depressed class women. This is reflected in the generally high degree of spatial co-variation between the labour participation rates of the two classes of females compared to co-variation between rates of depressed class male and depressed class female workers.

Finally, the author states that it is a regional cultural ethos to which females as a whole conform and the regional differences cut across class differences. Subtle cultural and historical processes account for regional variation. In particular social context is of vital importance.

I. SETTLEMENT : RURAL

I-1 : 19

K.Z. AMANI AND S. HASAN ANSARI, Spatial Diffusion of Kinwar Bhumiar Clan Settlements in Ghazipur District, *The Geographer*, Vol. XXIX, No. 1, 1982, pp. 31-40, 2 Diagrams, 1 Table.

The purpose of this paper is to test some of the theories and models of spatial diffusion in the case of the Kinwar Bhumiar clan settlements located in Muhammadabad sub-division of Ghazipur district in eastern Uttar Pradesh.

In order to calculate the time and distance of the diffusion of settlements, three factors have been considered i.e. population (P), distance (L) and time (T). It has been seen that the spatial diffusion of the Kinwar Bhumihar clan settlements started in the north from the banks of the river Ganga. In the first stage (before A.D. 1300) of the Kinwar Bhumihar settlement only six villages were founded in Ballia district at a mean distance of 28 km. from the initial node. In the second stage (between A.D. 1300-1600) of settlement diffusion 40 villages were founded. In the third stage (since A.D. 1600) one village was founded on the northern bank of the Ganga river. The first stage shows that the people have migrated to long distances, while during the second stage of diffusion the distance covered was small and the third stage shows a state of saturation.

I-1 : 20

R.C. TIWARI, Evolution of Rural Settlements in the Lower Ganga Yamuna Doab, *National Geogrpaher*, Vol. XXVII, No. 1, 1982, pp. 33-47, 1 Diagram, 2 Maps.

The aim of the present paper is to reconstruct the complex cultural landscape of the Lower Ganga-Yamuna Doab by tracing out the settlement history of the region and thereby explaining the morphogenesis of rural settlements in the region. The whole cultural sequence has been divided into three periods (1) ancient (2) medieval and (3) modern.

The ancient period has been further sub-divided into (a) Pre-Aryan (b) Aryan, (c) Buddhist and (d) Post-Buddhist periods. The Aryan settlements during the time grew into two more complexities giving rise to a six-tier hierarchy on the basis of their function- (i) Goshala (cattle ranch) (ii) Palli (small barbarian settelement) (iii) Durg of Vreja (Fort) (vi) Grama (Village), (v) Khargata or Pattan (town) (vi) Nagar (city).

The Maurayas and the Guptas introduced a highly organised system of administration which divided the whole territory into several districts and a number of villages.

The medieval period has been sub-divided into (a) Rajput and (b) Muslim periods. The modern period has been sub-divided into the (1) British and the (2) Post independence periods. Kannanj and Kora paraganas have been selected as case studies for examining the actual settling processes in the region. The attempt is based on the hypothetical diagram of five principles of settlement formation and colonization.

I-8 : 21

MINATI SINGH, Spatial Analysis of Rural Central Places in Lower Ganga-Ghaghra Doab, *Geo. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 27-39, 1 Diagram, 2 Tables, 4 Maps.

The present paper deals with identification of rural central places/service centres in the Lower Ganga-Ghaghra Doab which comprises the districts of Azamgarh, Ballia and Ghazipur. The rural central places/service centres numbering 218, have been grouped into four heirarchical orders on the basis of centrality indices. The spatial distribution has also been analysed with respect to the actual and theoretical spacings. The service regions of the central places have been delineated, firstly, on the basis of centrality indices and,

secondly on the basis of Thiessen Polygon method, and the entire system of functional organisation has been subjected to analysis by way of making a few generalizations.

J. SETTLEMENT : URBAN

J-1 : 22

K. VITHAL REDDY, Functional Transformation of an Urban Area : A Case Study of Secunderabad Cantonment, *Deccan Geographer*, Vol. XX, No. 1, 1982, pp. 197-201, 1 Map.

Secunderabad cantonment is a class I cantonment. After the Building Relaxation Act in 1970, 94 new colonies have come into existence. Data were collected for 64 of these colonies which occupy an area of 156 hectares.

In this paper an attempt has been made to examine the functional transformation that is being observed and the spatial pattern, with a view to understand the trend and also to pinpoint inadequacies or lopsidedness in development. The author is of the opinion that natural healthy environment of the cantonment is being polluted by the fact that the area is becoming one more "concrete jungle" by badly planned or unplanned activities.

J-2 : 23

JAYMALA DIDDEE, GITA KEWALRAMANI AND V.S. DATYE, Regional Changes of Agricultural Land to Non-Agricultural Uses in Bombay-Poona Corridor, *Geog. India*, Vol. XLIV, No. 2 1982, pp. 48-62, 3 Tables, 8 Maps.

The present analysis is an attempt to determine how far agricultural displacement i.e. shift of land from agricultural to non-agricultural uses can be employed as an index of urban growth.

Major regional variation in the scale of conversion of agricultural land to urban uses is observed in the Bombay-Poona Corridor for 1921-30 and 1961-70. The significant urban activities competing for space such as urban growth and change in land use, though not significant, does not point to a direct relationship between extension of non-agricultural land use and growth of population and urbanisation in the region.

J-3 : 24

A, AZIZ Growth Status of Towns of Uttar Pradesh (1931-1971) *The Geographer*, Vol. XXIX, No. 1, 1982, pp. 25-30, 3 Tables, 1 Map.

The decadal growth rates of population of towns of Uttar Pradesh from 1931 to 1971 betrays the fact that the pattern of growth is not always linear and the towns between themselves differ a great deal as far as rate of growth is concerned. The chequered growth pattern lends itself to a reasonable structuring on the basis of which towns can be put into four classes (a) static, (b) active, (c) dynamic and (d) explosive.

In the present paper the towns where decadal growth of population is less than 15 per cent at four points of time from 1931 to 1971 have been designated as static towns. Those towns where the decadal growth of population is 15 to 30 per cent at two points of time or more, have been designated as active towns. The towns where growth rate is between 30 to 45 per cent at two points of time or more are designated as dynamic towns and those where the decadal growth of population is over 45 per cent at two or more points of time are called explosive towns. Explosive towns are largely concentrated in the northern districts of Naini Tal, Dehra Dun and in the western districts of Meerut, Bulandshahr, Agra and Etawah.

Dynamic towns show greater concentration in western districts of U.P. Active towns are more widely spread out; static towns are few and their distribution does not show any geographic pattern.

J-3 : 25

H. RAMACHANDRAN, Urban Patterns : Some Reinterpretation and Implications for Urban Polies, *Ind. Journal of Regional Science*, Vol. XIV, No. 1, 1982, pp. 49-66, 5 Tables.

Current thoughts on Indian urbanization are centred around two themes, that the distribution of urban population reveals a "top-heavy" pattern and it is increasingly becoming so at an accelerated rate with a corresponding decline and stagnation of small and medium towns, and that the urban economic base is weak, being essentially composed of tertiary sector without adequate support of the productive manufacturing that neither of the two characteristics is desirable and they represent an anaemic

character of Indian urbanisation, a residue of the colonial attributes.

In the present paper, the author endeavours to bring out the weaknesses and the basic fallacies of this stream of thought with some reinterpretation of the observed patterns. The discussion is organised in three sections that deal with top-heavy distribution of urban population, tertiaryation of the urban economy and the deviations from national patterns. The analysis is based on secondary data pertaining to urban Karnataka, although incidental examples from other parts of the country as a whole are also included.

J-3 : 26

S.S. NARYANSWAMI, City Size Distribution as a Simple Random Walk, *The Ind. Geogr. Jour*, Vol. LVII, No. 1, 1982, pp. 14-23, 3 Tables.

In the present paper, the problem of representation of city-size distribution by a finite closed homogenous Markov model for a simultaneous analysis of changes in the individual urban areas and in size classes has been discussed. The initial probability density and the transition probabilities help us to specify the system. The transition matrices constructed in this analysis belong to a special type of Markov chain wherein all cities are likely to move to the largest class. The special feature of the transition matrices that there is not even a single movement either forward or backward for more than one size class in a single decade is demonstrated through a simple random walk with varying probabilities. The data analysis as fitted to the model described is done through a closed system of 'cohort of cities' on Tamil Nadu urban data.

J-8 : 27

D.S. RAO AND N.B.K. REDDY, Spatial Centrifugal Functions in A City Region, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 67-73, 2 Tables, 1 Map.

In the present paper, nodality as well as the hierarchy of nodality of the cities of Andhra Pradesh have been examined. The study indicated that the cities which have high nodality index, have flourished better, while cities with low nodality index have a low development of the city-region. In fact, the origin, growth and development of a city mainly depends on its site.

The authors have considered the density of houses also as a centrifugal function. They have found a positive correlation between the density of houses and the density of population. The distance decay analysis of the density of houses in a city region reveals the level of development of the region. Low rate of decrease in the density of houses with the increasing distance from the city to its region indicates high spatial interaction between a city and its hinterland.

J-8 : 28

P.C. AGARWAL AND Z.T. KHAN, Functional Characteristics of the Outgrowth of Class I and II Towns of M.P. *The Geographer*, Vol. XXIX, No. 1, 1982, pp. 41-55, 9 Tables, 2 Maps.

In the present study, the functional characteristics of the outgrowth of class I and II towns of Madhya Pradesh have been analysed. At the 1971 census, Madhya Pradesh had 22 towns belonging to class I and II which and urban outgrowth. Urban outgrowth is a common phenomenon in case of class I and II towns in Madhya Pradesh. The outgrowth communities demonstrate the conditions prevailing on the fringe of central towns. These central towns are generally municipal towns, a few are cantonment towns and one i.e. Bhilainagar is a town administered by its steel plant management. Comparison between outgrowth centres and central towns with respect to concentration of functions has also been made. Ultimately, functional classification of outgrowth centres has been done. Mono-functional outgrowth centres are specialised in agriculture, bifunctional outgrowth centres have transport and services as leading functions, trifunctional outgrowth centres have manufacturing, agriculture and services as the first function. Quadrilateral outgrowth centres have four functions followed by service, trade and agriculture as the leading outgrowth functions.

L. REGIONALISATION, REGIONAL DEVELOPMENT AND PLANNING

L-1 : 29

C.R. PATHAK, Rural Industrialization for Rural Area Development (Rifrad), *Indian Journal of Reg. Science*, Vol. XIV, No. 1, 1982, pp. 81-90, 1 Table.

In this paper the author has discussed some aspects of industrialization and its role in the rural area development with case studies of three industrially backward districts of West Bengal—a state once highly industrialized but declining recently in industrialization both in the urban-based organised and the rural-based unorganised sectors since the mid-sixties.

The author is of the view that rural industrialization has a significant role to play in rural area development. There is a case for the development of small scale and cottage industries provided they are modernised both in terms of technology and methods of production and distribution in the industrially backward rural areas and also in the developed areas in creating jobs and opportunity for the rural people. These industries are agro-based and can be integrated with agriculture in a symbolic frame-work.

The author concludes that (1) all the suggested potential industries of the three districts—Midnapur, Bankura and Purulia—are based on local raw material, labour and market and that (2) none of the districts is experiencing any significant change in favour of modern industries.

L-1 : 30

SATYESH C. CHAKRABORTY, *Regional Planning : A Framework of Operation*, *The Indian Geographical Journal*, Vol. LVII, No. 1, 1982, pp. 1-13.

In the present paper, an attempt has been made to state a few basic concepts which can help a practitioner in regional planning to identify a framework of operation. The concepts selected for this purpose will, however, not resolve all the issues or problems that a regional planner faces in preparing a plan. Nevertheless, these are expected to provide a sufficient number of moorings to place firmly upon.

The author has examined four basic concepts of regional planning. These are the meaning of territorial transferability of resources, the relationship between population agglomeration and clustering of economic activities, the implications of capital-output ratio in social development, and the planners responsibility in setting a target of income increase. It is on the proper understanding of these four issues that the inter-relationship between national and regional planning organisations depends.

L-1 : 31

SHAMSHER SINGH, Village Planning : A Wayout to Approach, NGJI, Vol. XXVIII, Parts 1 and 2, 1982, pp. 56-59.

The Indian village society is stratified, both socially and economically. According to the author the stratifications are as under: (a) occupational, (b) spatial, (c) educational (d) institutional, (e) behavioural, (f) psychological and (g) stratification regarding access to resources. The paper has emphasized that for healthy development of the village society each stratum should be treated separately in the light of others. According to the author, separate treatment to Scheduled Castes, Scheduled Tribes, small and marginal farmers and village artisans is nothing but looking at this approach from a different angle.

L-5 : 32

H.H. SINGH AND JAGDISH SINGH, Service Centres Strategy in Regional Context : A Case Study of Upper Damodar Valley, National Geographer, Vol. XXVII, No. 1, 1982, pp. 15-32, 2 Diagrams, 2 Tables.

In the present study, it has been assumed that commercial population of a centre is a controlling factor of its capacity and range. Thus, the centrality of a centre (Ci) is the percentage of its commercial population with reference to a regional commercial population.

In preparing hypothetical arrangement of service centres, Dhanbad is considered as the nodal centre in terms of administrative as well as various socio-economic functions. The centres of higher order are more concentrated along the Damodar. At different levels the restrictive role of physical factors on one hand and attractive role of mineral resources on the other, has also been well-marked. The transport routes are considered as the basic channels of energy flow as well as mobilization of resources and growth. Finally, it has been found that polarisation of economic activities in terms of production owing to resource localisation, transport intensity and homogeneous characteristics of landscape has created regional imbalances and wide gaps in spatial system. Dhanbad, Jharia, Chas, Giridih, Hazaribagh and Ramgarh are controlling centres which channelise the development energy into lower order centres through feedback process. They will not be able to cope with the problems in future due to excessive increase of population by 2001. Thus the provisions for infrastructural co-ordinates, transport development, localization of new service

centres in the western and northern part of the upper Damodar Valley, dispersion of service centres in hierarchical order may only help in minimizing the spatial gaps prevailing in the economic and service landscapes.

M. METHODS

M-2 : 33

KALPANA MARKANDEY, Factor Analysis in Geography, *Geo. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 89-92, 1 Diagram.

The present paper is in the nature of resume on the methodology of Factor Analysis. This technique has gained popularity in social science research and hence merits special attention. It has the virtue of reducing a large number of variables into a few factors which explain a major part of the variance in the original data. This quality of sieving out the basic traits latent in the data is immensely useful in multivariate analysis. This paper gives a concise picture of the merits and demerits of this technique as an instrument in classification and testing of hypotheses.

M-2 : 34

S. SUBRAHMANYAM, Macro Programming Model for Regional Industrialisation : An Application to East Godavari District, *Ind. Jour. of Reg. Science*, Vol. XIV, No. 1, 1982, pp. 1-11, 6 Tables.

In this paper an attempt has been made to suggest an optimum pattern of industrialisation for an agriculturally prosperous district viz. East Godavari of Andhra Pradesh, keeping in view local resources and development problems. Section I delineates the state of the district economy. Section II focuses on the development model suitable for the district. Section III is devoted to the formulation of a linear programming model for district industrialisation and highlights the result of the solution. The major conclusions of the study are summed up in Section IV.

M-2 : 35

V.L.S. PRAKASA RAO AND V.K. TIWARI, Urban Population Density Models and Correlates, *Geographical Review of India*,

Vol. XLIV, No. 2, 1982, pp. 1-18, 4 Graphs, 2 Diagrams, 7 Tables.

Population density is one of the basic elements of urban forms as the size, structure or age of the cities are often expressed in this element. The dynamic nature of urban growth has its influence on urban density. Various theories have been propounded to analyse the density gradients on urban areas of the developed as well as the developing world. The various models of urban population density gradients along with the problems of data generation and their application to fit in the context of Indian cities have been examined in this paper. Some correlates of population density based on the density structure of Bangalore city have been examined as a case study.

M-3 : 36

SHIBANI ROY, Mapping of Cultures, *Man In India*, Vol. LXIV, No. 2, 1982, pp. 140-148.

In this paper the concept of culture area has been dealt with. India so far has not been under the purview of culturists mainly due to its immense variety. The author is of the opinion that it is time when Indian anthropologists drew out a blueprint for mapping cultures of India. Taking the lines of American anthropologist Boas, a geographer turned anthropologist and his disciple Wissler, the author has provided a blueprint after N.K. Bose (1956), who has taken India as a cultural continent and has sub-divided it into north-western, eastern and southern regions. The demarcating line between northern and southern regions tentatively passing over Maharashtra extending to Bihar and Bengal shifts in accordance to the cultural trait.

M-4 : 37

S.C. JAIN, A.K. TAYAL AND C. N. REDDY, Analysis and Planning of Saharanpur Region for Development and Growth using Remote Sensing Techniques, *Photo Nirvachak*, Vol. X, No. 1, 1982, pp. 15-25, 1 Graph.

In this study the analysis of Saharanpur region has been done using landsat imagery. Land utilisation map (by visual interpretation) was prepared on the base map obtained from 1 : 250,000 topographical sheets. Three main elements of the image, namely, texture, tone and pattern were interpreted. Sample

verification of the land use was done by the interpretation of 1 : 10,000 scale photos for plains and 1 : 50,000 scale photos for hilly areas. Some of the information about population and the distribution of the population are found equivalent to that of census report. Information about the communication pattern was obtained from the topographical sheets and aerial photographs. Hierarchy of settlement, land utilisation, population pattern and the size of settlements were determined, the authors are of the opinion that remote sensing is an easy, economical and time-saving technique to find out the hierarchy of growth centres.

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Q. GEOMORPHOLOGY



Q : 38

B.G. WAGLE, Lineaments in the Coastal Zone of Goa, *Photo Nirvachak*, Vol. X, No. 1, 1982, pp. 45-49, 1 Diagram, 1 Map.

The paper describes the lineaments in the coastal area of Goa, identified on aerial photographs and their correlation with the lineaments reported from the adjoining areas. The majority of lineaments along the coastal part of Goa follow NW-SE, NE-SW and some ENE-WSW trends. The NW-SW direction is predominant and corresponds with the regional Dharwarian trend. Some lineaments have NE-SW trends due to cross-folding of Dharwar Orogeny.

Q : 39

C. PRASAD, Some Aspects of the Environmental Geology of the Himalaya with Special Reference to Uttarakhand, *Journal of Himalayan Studies and Regional Development*, Vol. V-VI, 1981-82, pp. 1-6, 2 Diagrams, 2 Tables, 1 Map.

The present paper aims at projecting the role of geological environments of Himalayas and their influence on the environmental conditions of the entire region. The principal geological environments are, rock formations and structures that have been formed by the geological processes. The rock formations and structures are continuously being modified by both endogenetic and exogenetic processes. In this way various landforms are produced. As the endogenetic processes are controlled by the structural history of the Himalays, the exogenetic

processes are influenced by the climatic conditions in turn affected by physiography.

The author is of the opinion that due to gradual receding of the glaciers of Uttarakhand Himalaya, the cold desert covering the sub-zone is enlarging and the highly forested phreatic division is contracting.

The environmental conditions are worsening in phreatic and sub-phreatic zones of Uttarakhand which are considerably populated. Increased human activities are adding to the problems. It is obvious that the environmental degeneration in the Uttarakhand Himalaya is likely to affect the environment of north Indian plains adversely.

Q : 40

ENAYAT AHMAD, Geomorphology and Glacial Features of the Himalay, *The Geographer*, Vol. XXIX, No. 1, 1982, pp. 1-13.

The present paper is a review of the works which have been carried on by the early geologists on the geomorphology of the Himalayas, describing the evolution and origin and structural characteristics of the glacial features of this region.

The area consists generally of steeply sloping surface, deeply cut 'V' shaped valleys of such high gradient that large pebbles of crystalline rocks from the high Himalayas are carried down to the sub-Himalayan piedmont zone. The valleys although relatively straight, viewed from a high level plain or space satellite, are fairly sinuous in detail marked by interlocking spurs. The slopes and heights of the densely forested ridges, hills and ranges of the lesser Himalayas fade into relative insignificance as the snow-clad Great Himalayas are approached. The Great Himalayas are marked by glacial landscape with moraines, "hanging valleys", pyramidal peaks, corries etc. With per-glacial features, e.g., strong solifluction occurring further downwards.

Large scale peneplanation has not occurred in the Himalayas, but erosion levels are found in Karakoram-Kunlun area. Rolling plains of Aksai Chin and Deosai plains are the examples.

Q : 41

INDRANI CHATTERJEE, Geomorphic Characteristics of Darjeeling District (West Bengal), *Geo. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 63-70, 1 Diagram, 1 Table.

In this paper, geomorphic characteristics of Darjeeling district have been discussed with quantitative estimation and frequency distribution analysis of few measured terrain factors. The factors relate to both topographic and textural aspects of the terrain, which determine the range of geomorphic characteristics present in the area differing widely in lithology, structure, micro-climate, etc. Their determination of statistical parameters, like mean ($\bar{X}$), median (M_d), mode (M_o), standard deviation (S), skewness (Sk) etc. give a quantitative basis for description of the terrain factors in their spatial pattern and their relationship to population distribution.

R. HYDROLOGY

R : 42

S.C. JOSHI AND J.S. RAWAL, Channel Morphometry Indices and Stream Discharge in the Kumaun Himalaya, *Geo. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 71-78, 2 Diagrams, 2 Tables.

Although the statistical relationship between geomorphology and hydrology has long been recognised by geomorphologists, it was Horton (1945) who first suggested it in specific terms. Notable amongst the later attempts are the works of Thomas and Bensan (1970) who revealed intimate relations between topographical characteristics and water discharge indices of drainage basins. A significant contribution in this direction was of integrating the regression equation $C = a \sum L_b$, where C relates to channel capacity and $\sum L_b$ is total stream length. The present study justifies such a relationship in the Himalayan rivers by using data of 10 basins selected in its Kumaun section. A regression model developed in the form $DS = -0.60 + 0.04 \sum L$ cusecs suggests stream discharge as a function of total stream length which accounts for 74 per cent of variation in the stream discharge.

S. CLIMATOLOGY

S : 43

O.N. DHAR, A.K. KULKARNI AND B.N. MANDAL, A Study of Maximum and Probable Maximum Rainfall over

Uttrakhand Himalaya and its Neighbourhood, *Journal of Him. Std. and Reg. Development*, Vol. V and VI, 1981-82, pp. 7-17, 2 Tables, 7 Maps.

The present paper is a study of maximum and probable maximum rainfall over Uttrakhand Himalayas and its neighbourhood.

It has been observed that the highest one-day rain amounts of stations near the foothills are higher than the highest rain amounts recorded in the interior Himalayas. Analysis of rainstorms of North India have shown that the rainstorms of September 1880 and September 1924 were the severe-most. These rainstorms yielded areal rain-depths which have not been exceeded so far.

T. SOIL GEOGRAPHY

T : 44

A.K. BANDOPADHYAY, B.K. BANDOPADHYAY AND J.S.P. YADAV, Effect of Different Crop Rotations on Salinity of Coastal Soils of Sunderbans, *Journal of Indian Society of Soil Science*, Vol. XXX, No. 2, 1982, pp. 242-244, 1 Diagram, 1 Table.

An experiment has been undertaken to examine the changes in soil salinity under different crop rotations in the Sunderbans area. The results of field work and laboratory analyses show that in order to reduce the soil salinisation, it is desirable to grow some crops in the rabi season. If irrigation water is available rotation of rice can appreciably reduce the soil salinity. However, if water for irrigation is available in limited quantity a rotation of rice and cotton will help in minimising the accumulation of salts in the surface layers.

T : 45

K.S. BHATIA AND K.K. SHUKLA, Effect of Continuous Application of Fertilizers and Manure on Some Physical Properties of Eroded Alluvial Soils, *Journal of the Indian Society of Soil Science*, Vol. 30, No. 1, 1982, pp. 33-36, 2 Tables.

Continuous application of farm-yard manure (FYM) for five years helped in maintaining and improving physical properties of eroded alluvial soil and gave higher crop yield in comparison to application of chemical fertilizers alone. Chemical fertilizers did not improve the physical properties of soil. It has been concluded that if nitrogenous fertilizer is used in combination with FYM and superphosphate, higher yields of maize can be obtained without any deterioration in the physical make-up of the eroded alluvial soil.

U. BIOGEOGRAPHY

U : 46

S.C. TIWARI, Phenological Pattern in Submontane : Grasslands of the Garhwal Himalayas, *Journal of Himalayan Studies and Regional Development*, Vol. V-VI, 1981-82, 2 Diagrams, 3 Tables, 1 Map.

In the present study, the main objective is to identify the timings of important biological events for various plant species at two distant habitats (mountain ridge and saddle) still at a same general altitudinal level on a mountain flank of Pauri hills constituting submontane zone of Garhwal Himalaya. The events taken into consideration are (a) germination (b) vegetative growth (c) flowering (d) fruiting and (e) seed-maturation.

W. NATURAL RESOURCE BASE

W : 47

M.P. KARENNAVAR AND S.S. HIEMATH, Natural Resource Endowment Regions of Karnataka, *Geo. Rev. India*, Vol. XLIV, No. 2, 1982, pp. 79-88, 3 Tables, 1 Map.

A resource region is a homogenous area of physical and human resources on which economic activities of man depend.

In this paper, natural resource-endowment regions of Karnataka state have been identified with the help of quantitative techniques. Six individual natural resource-endowment regions of Karnataka, based on land, forest, water, animal, mineral and soil have been identified. An attempt has been made to identify resources regions on a composite basis.

W : 48

O.P. KANDARI, Nanda Devi National Park : India's Highest Himalayan National Park : Problem of Resource Use and Conservation, *Journal of Himalayan Studies and Regional Development*, Vol. V and VI, 1981-82, 3 Maps, 3 Photographs.

The present study attempts to study the ecology of Nanda Devi National Park and the importance of increasing human intrusion on its ecosystem.

The author has described the topography, climate flora and fauna of this park. Human intrusion started in this park only in 1934. Once the inner sanctuary was opened to the general public, in addition to the mountaineers, naturalists and tourists, the herb gatherers and poachers also became active in the area, and thus an era of unwise exploitation began. These activities will increase manifold if not checked in time.

Deforestation, forest fires and soil erosion are the results of this unwise exploitation. Apart from its direct effects, deforestation poses a considerable impact on the successional process and on climate. Shepherds, hunters and plant gatherers have accelerated the process of extermination of plants and wild animals.

These adverse effects on the biotic and cultural environment of the area can be minimised through wise management.

X. ECOSYSTEMS

X : 49

G.S. RAJWAR, Ecological Problems of Mussoorie Hills and their Solution, *Jour. Him. Std. and Reg. Dev.*, Vol. V-VI, 1981-82, pp. 73-76.

In the present paper ecological problems of Mussoorie hills and their solutions have been discussed.

Mussoorie hills besides being of tourist importance possess a treasure of flowering plants which are of economic importance. The forests of the area also perform the function of water control and protection by binding the soil. The over-exploitation of these forests for different uses has become a hazard to the ecology of the region. The beauty of these hills is endangered.

The quarrying for limestone and marble in the Mussoorie hills is another activity which is threatening the ecosystem. As a natural consequence of blasting and deforestation landslides have steadily increased in recent years and the damage caused by them has mounted over years. The stability of Mussoorie city itself is endangered because of quarrying within 3 km. of the city itself. The quarries also affect the vegetation near to them.

The author suggests that in order to restore ecological balance what is immediately needed is to evolve balanced forest policy. The open dynamiting in all these hills should be changed to tunnelling and the quarrying should not be permitted simultaneously in all the hills. The complete uprooting of the plants must be stopped. Local people should be educated against the felling of trees for their domestic needs.

Z. BEHAVIOURAL GEOGRAPHY

Z : 50

ANJANA P. DESAI, Environmental Quality in the Core City of Ahmedabad : A Study in Residents Perception, *NGJI*, Vol. XXVIII, Parts 1 and 2, 1982, pp. 1-14, 12 Tables.

The objectives of the study are to understand urban environmental quality through the perception of residents and to compare it objectively with the help of existing secondary data and also to compare it relatively with the perception of the investigators and then to arrive at certain suggestions for metropolitan neighbourhood planning.

The study area is the core area (walled city) of Ahmedabad. The period of study is 1979-81.

An attempt has been made to measure the environmental quality on a micro-level basis (ward-wise). The assessment of environmental quality has been further augmented by secondary data of housing facility; distribution of diseases and crime, density of persons per room.

The residents have overrated the environmental qualities of their respective neighbourhoods. Residents like to live in the parts of the core city as the life style is based on primary relationship and personal identity. In addition to these social reasons, economic reasons are also important for them to stay there e.g., low price for daily needs, unrevised low rent and minimum transportation cost. Being satisfied on socio-economic grounds, residents have adapted themselves to the physical problems of the environment.

Part II

1982

1982: Part II

A. HISTORICAL GEOGRAPHY

A-2 : 1

MEHDI RAZA, Climatic Change in Indian Prehistory : Bronze Age, *The Geographer*, Vol. XXIX, No. 2, 1982, PP. 5-11, 1 Diagram.

In the present paper a brief general review of climatic changes in north-western Indian subcontinent during Bronze age has been provided.

Referring to relevant literature, the author observed that in prehistoric time the population must have been enabled by a more bountiful rainfall and a prosperous agriculture. To substantiate this hypothesis a mass of hydrological, zoological, botanical and archaeological evidences have been produced to show that there has been a significant decrease in rainfall since the prehistoric times due to climatic change. But Raikes and Dyson are against this hypothesis of desiccation. They were of the opinion that man's over-exploitation of environment was responsible for the degradation of the environment.

Pratibha Mishra

B. POLITICAL GEOGRAPHY

B-2 : 2

M.A.H. SIDDIQUI, Politico-Geographic Environment of the Indian Ocean Littoral- An Enquiry into Power Relation, *Annals, NAGI*, Vol. II, No. 1, 1982, PP. 49-52.

In the present paper Politico-Geographic environment of the Indian Ocean Littoral has been discussed with an enquiry into their power relations. Theoretically, the strength of power can be assessed on the basis of such components as (i) morphological power (ii) demographic power (iii) economic power (iv) organisational power and (v) military power.

W. Fuchs' formula for determining power, $\text{Power} = P \sqrt{B}$, where P represents production and B represents population, and

Boulding model for determining "Hostility versus Friendliness" index are the statistical methods of assessing power. Using Boulding's model the degree of friendliness or hostility between India and other Littoral countries of Indian ocean has been calculated, as a result of which Malaysia emerges as the most friendly country and Pakistan a hostile one in this group.

B-5 : 3

R. D. DIKSHIT AND J. C. SHARMA, The 1980 Assembly Elections in Punjab : An Inquiry Into Bases of Political Party Support, *Annals*, NAGI, Vol. II, No. 1, 1982, PP. 36-48, 8 Tables, 2 Maps.

This paper presents an ecological analysis of areal patterns of support for the five leading political parties in the 1980 Assembly Elections in Punjab. The objective is to examine how far electoral support for each political party is regionally concentrated or uniformly spread over the entire area of the state and to measure how far the support base of each political party is secular and/or communally oriented. Attempt has also been made to measure the degree to which socio-economic contexts explain vote variance of each party. To facilitate analysis a set of 21 selected variables has been selected with assembly constituency as the unit of analysis.

The analysis reveals that while the Congress and the Bhartiya Janta Party have derived greater support from the more urbanized, Hindi speaking and Hindu majority areas where the scheduled castes constitute a relatively small proportion of the total population, the political support bases of the Akali Dal and the two communist parties--CPI and CPI (M) - lie in the more predominantly rural Punjabi speaking and Sikh majority areas of the state where the proportions of Scheduled Caste voters is relatively higher, although in reality electoral performance of these parties particularly the Akali Party may or may not bear positive relationship to the proportions of Scheduled Caste voters in these constituencies.

C. SOCIAL GEOGRAPHY AND ANTHROPOGEOGRAPHY

C-7 : 4

PAK-LEK LIANG, Social Equality and Economic Development in India : Spatial Structures and Correlates,

Singapore Journal of Tropical Geography, Vol. III, No. 1, 1982,
PP. 53-68, 8 Tables, 8 Maps.

The primary objective of the present study is to delineate the implications that economic achievement may have for the various aspects of social equality in India.

The study begins with two pieces of empirical analysis one on social equality and another on economic performance in India, both, in a regional context. The empirical pattern of aggregate interrelationships between these two spatial systems of variation is explored. Finally, a structural model is propounded for the possible impacts that rates of socio-economic changes and levels of development may have on general dimension of social inequality.

The author is of the opinion that in terms of social service provision and policy efforts, social equality in India is not likely to bear a linear relationship with the level of regional development.

The phenomenon of urbanisation has been found to be of particular importance in articulating the spatial variation of social equality. The index of urban primacy, which captures very well core-periphery structure of the Indian spatial economy in terms of regional urban concentration, is the only aggregate measure of aspects of the regional economies that adequately depicts the regional contrasts in social equality. Frontier social development efforts invoked by national security and integrity considerations have elevated some of the most backward regions, to and above the level enjoyed by the industrially advanced regions on the scale of social equality, producing a peculiar non-linear relationship between economic development and social equality which can only be captured by the urban primacy index.

The rate of regional urban population growth has also been found to have direct impact on the level of social equality.

C-7 : 5

S. B. SINGH, R. P. SINGH AND B. N. SINGH, Spatio-Temporal Analysis of Modernisation in a Rural Environment, *N.G. J. I.*, Vol. XXVIII, Parts 3 and 4, 1982, PP. 197-203, 2 Maps.

According to the authors, modernisation is an extension of the past into the future and in the process, the tradition norms gradually change. Community development is a part of the total process of modernisation. This paper aims to substantiate the above view through the analysis of structural and sequential variables in

Rohtas district of Bihar utilizing data on Community Development, at the block level (1961 and 1971).

Economically, the study area is a less developed region mainly due to the lack of irrigation and other infrastructural facilities. The authors have discussed (1) primary employment index (2) traditional craft dominance index (3) range of commerce index (4) index of literacy, (5) dependency ratio (6) urbanisation index (8) medical facilities (9) educational and (10) communication facilities and found out that the period of 1961-71 records an appreciable increase in deviation values as several important innovations have kept diffusing through the blocks so much so that six more blocks were added to the category of high level of modernisation in 1971 over 1961.

C-8 : 6

R. CHITRALEKHA, Poverty and Levels of Nutrition : Some More Evidences, *The Indian Geographical Journal*, Vol. LVII, No. 2, 1982, PP. 58-61, 1 Table.

The association between poverty and levels of nutrition among the agricultural population of Truvallur Taluk, Chengalpathu district, Tamil Nadu, is tested in this paper.

The study analyses two aspects of poverty-income levels and food intake. It focuses attention on the nutritional deprivation in the lower strata of population where the poverty has led to very serious consequences.

The inter and intra-variations in nutrition have been related with income variations.

D. GENERAL ECONOMIC GEOGRAPHY

D-5 : 7

H. P. DAS Resources and Infrastructural Development in North East India, *Geo. Rev. India*, Vol. XLIV, No. 3, 1982, PP. 81-93, 5 Tables.

In this paper the present state of resource use and growth of infrastructure in the five states and two union territories of North East India have been discussed. The author gave an account of the

location, history population, demographic pattern and cultural diversity. It has been found that growth of infrastructural development and extent of resource use of the region do not keep pace with the increase in population. This has given rise to certain regional problems such as (a) fear of alienation from the rest of India due to distance from Delhi (b) transport difficulties due to location and other geographical reasons (c) neglect by the central authorities resulting in lack of infrastructure for industrial and agricultural development (d) the problem of spreading Christianity in the region, thereby, making the people more akin to western culture.

The author is of the opinion that these problems have been further aggravated by the very nature of the backward economy of the region.

D-5 : 8

V. C. MISHRA *Social Dynamics of Resource Development, Hill Geographer*, Vol. I, No. 1, 1982, PP. 1-7.

The present paper analyses the relationship of natural resources with the attributes of society.

Planning for resource development is carried out in a sequence. It is regarded as a process consisting of three phases — resource inventory, evaluation and development.

In case of India, at microlevel institutions fail to assess local resource potentials to devise appropriate techniques of programme/project formation and to create institutional infrastructure to implement them. Consequently *ad hoc* decisions are taken. Actually colonial influence is so deep-rooted in perception, attitude and behaviour of the people as well as of the administration that it subconsciously influences the resource sector.

The author is of the opinion that the present situation of resource management, exploitation and utilization can be described under the setting of internal colonialism, sometimes termed as 'core-periphery' relation.

This is high time to rationalise the use of natural resources in the light of commitment of the welfare of the society.

D-7 : 9

BISWARUP GOSWAMI, Development of Tourism in the Andaman Islands, *Ge. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 71-75, 1 Map.

The various facets for the development of tourism in the Andaman Islands are discussed here. The island is located at considerable distance from the mainland of India which is a handicap but its pristine beauty is a positive advantage for the development of tourism. The author is of the opinion that tourists should be encouraged to move round to have the views of marine flora, fauna and rich vegetation around them as well as to witness the lifestyle of the local people. Due to its location on the trade route of India with Burma, Far-east and south-east Asia, creation of a duty-free port is also suggested.

E. AGRICULTURAL GEOGRAPHY

E-1 : 10

A. P. SUKLA, Spatio-Temporal Organisational Dimension in Siang Region : Arunachal Pradesh, *Hill Geographer*, Vol. I, No. 1. 1982, PP. 14-20, 1 Map.

The present study discusses the spatio-temporal organisational dimensions of agriculture in Siang Region of Arunachal Pradesh.

Development of permanent cultivation as an alternative to jhuming in the background of its location and space economy, technique and scale economy becomes of relevance to planning agriculture in the Siang Region. Space and scale economy favour the case of further intensification of such agriculture in the region. Organisation economy has prepared the ground for such intensification and is making endeavours to increase the physical scale of permanent cultivation also by developing terraced cultivation in deep interiors.

The author is of the opinion that the prevailing production economy conceals ample scope for intensification of scale through production in the mixed technique of cropping and effectuating reutilisation of land for more than once in an agricultural year.

E-1 : 11

M. SHAFI, Perspective on Von Thunens Theory, *The Geographer*, Vol. XXIX, No. 2, 1982, PP. 1-4, 1 Table.

The paper presents a perspective on Von Thunen's Theory. According to the author Thunen's model does not correctly explain the location of crops because it considers transport as the only factor in minimizing the cost for the maximization of profit, whereas in the modern time there are factors like labour, irrigation, fertilizer, new agricultural technology which play profound role in minimization of cost. The farmer, in view of his long and mature experience, takes into consideration the various constraints on an empirical basis and arrives at a decision. For the purpose the author finds linear programming over — simplified and stochastic model too complicated. He himself suggested a weightage assessment programme. He has finally observed that it is not the relative distance which determines the maximum profit but the weightage of a host of factors considered in a decision matrix that will determine the location of crops in respect of maximum profit.

E-1 : 12

O. P. SINGH AND DINESH C. PANDEY, Man-Land Ratio : A Resource Appraisal of Kashipur Tehsil, Naini Tal, *The Indian Geographical Journal*, Vol. LVII, No. 2, 1982, PP. 68-70, 2 Tables.

The paper makes a resource appraisal and examines the population pressure on agricultural land in the Kashipur Tahsil, Naini Tal. The pressure of population has been stratified into weight groups i.e. high, medium and low etc., and intensive study of the various weight groups of population pressure is attempted. The paper also investigates the relationship between agricultural population and agricultural land.

E-2 : 13

M. M. DAS, Agricultural Landuse and Cropping Pattern in Assam, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 32-39, 3 Tables.

In this paper an attempt is made to analyse the agricultural landuse and cropping pattern in Assam. In the first stage, only nine principal crops, covering one or more than one per cent of the cropped area, are selected and their spatial distribution is shown. In the second stage, spatial concentration of these nine principal crops is obtained by using the 'Location Quotient' method which helps derive the crop combinations in different parts of the state. In the last stage, spatial variation of crop diversification is found out which helps in regionalising diversification of crops in the State.

E-3 : 14

S. PADMAJA, Mahaboobnagar District : An Analysis of Land Capability, *Indian Geographical Journal*, Vol. LVII, No. 2, 1982, PP. 82-86, 1 Table, 2 Maps.

In this paper land capability analysis of Mahaboobnagar district of Andhra Pradesh has been attempted. For the purpose seven parameters namely land use, phisiography, stream frequency, soil, irrigation, slope and crop acreage have been taken into account. The formula applied is :

$$SR = \frac{100 \times D}{G}$$

Where, SR = Sum Ratio, D = Data, G = Gross total for a column. The composite index varies from 26.63 to 36.86. It is found that four tehsils have a high potential as far as land capability is concerned, whereas three other tehsils are having low land capability as they are highly rugged with thin soil cover, steep slope and less irrigation facilities. Most of the hilly area has a forest cover, thereby, providing less opportunities for agriculture within the zone.

E-11 : 15

Y. G. JOSHI, Spatial Impact of Tribal Development Blocks on the Agricultural Development--A Study of Jhabua Dist. M. P., *Geo. Rev. Ind.* Vol. XLIV, No. 4, 1982, PP. 52-62, 11 Tables.

Based on the empirical study of twenty villages of different tribal development blocks in Jhabua district the aim of the present paper is to analyse quantitatively where tribal development block centres have acted as the centres of innovation for agricultural development. It is concluded that in the tribal community, the geographic distance from the T. D. Centre does not matter much, but it is either the economic feasibility or the capability of the individual due to his economic status or political approach, which has divided the village community into those who have been benefitted by the government programmes and those who could not be.

G. GEOGRAPHY OF TRADE AND TRANSPORT

G-1 : 16

SHUBHRA DWIVEDY, Pattern of External Trade in a Colonial Setting; A case study of the North Eastern Plateau (1884-1947), *N.G J.I.*, Vol. XXVIII, parts 3 and 4, 1982, PP. 127-133, 2 Tables.

In the present paper the author has tried to analyse the structure and composition of the imports and exports of metals, ores, millwork and machinery that was taking place between India and metropolitan powers during the colonial setting. The volume and trend of imports and exports of various metals and ores in their various forms during the period 1888 and 1947 reveal :

- a. the total value and quantum of imports of all the ores, metals, millwork and machinery exceeded that of their export;
- b. the composition of imports showed that manufactured goods formed major bulk of the total value of imports; and
- c. minerals either in the form of ore or semi-processed constituted the major share in the total value of export.

This shows the exploitative character of the imperial policy.

H. POPULATION

H-1 : 17

RAM DAYAL SINGH, Spatial Variation of Population Densities in Patna (Bihar), *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 81-85, 1 Table.

The author has endeavoured to trace out population density patterns in a metropolitan community of Patna in the light of the negative exponential model enunciated by Clark (1951) and later modifications thereof and examine their validity in Indian context as ventured by Brush (1968).

Observations have shown that geographical, historical, economic and social factors have largely been responsible for the existing patterns of population in this city. The author is of the opinion that because of lack of proper planning untill recently,

Patna could flourish in a more haphazard manner in which the central tendency of population concentration dominated the urban scene. In addition, the density gradient profile is reflected by dualism due to the impact of British administration.

H-2 : 18

MEHAR SINGH GILL, Pattern of Growth of Rural Population in Hissar District, Haryana, *Geo. Rev. India*, Vol. 44, No. 3, 1982, PP. 38 49, 2 Maps.

The patterns of growth of rural population in Hissar district were mainly determined by availability of irrigational facilities, primarily Bhakra canal waters, extended to the area in the post-1951 period. Whereas high growth of population has been a characteristic feature of areas and those adjoining the rapidly growing urban centres, relatively low growth has been the lot of the tracts characterized with dense population and poor agricultural economy.

The discussion on spatial patterns is mainly based on two choropleth maps drawn by plotting data for each of the 1,059 inhabited villages.

H-2 : 27

PHANI BHUSAN RAY, Trend in Population Redistribution in West Bengal, 1901-1971, *N.G.J.I.*, Vol. XXVIII, parts 3 and 4, 1982, PP. 180-185, 6 Tables.

The present study examines the trend in population redistribution in West Bengal during 1901-1971 in the light of regional disparities. The study concludes that the regional imbalance in population distribution within the state of West Bengal is gradually decreasing. It is true that the rugged topography, sterile soil, paucity of water and unfavourable climatic conditions do not favour dense human habitations in the western and northern districts of the state. On the contrary, industrialisation and urbanisation along the banks of the river Hooghly and in the coal producing regions of the state have attracted population. Physical factors hardly undergo any appreciable change in a short span. So it is quite likely that economic and social transformation might have played the dominant role in this regard. The lessening of regional disparities in economic development after Independence, has presumably lessened the regional disparity in population distribution.

H-4 : 20

R. N. SINGH AND SAHAB DEEN, Transport and Communication in the Occupational Structure of Urban Centres in Eastern Uttar Pradesh, *Geo. Rev. India*, Vol. XLIV, No. 3, 1982, PP. 69-80, 2 Tables, 2 Maps, 2 Diagrams.

An attempt has been made here to present an occupational analysis of population especially those engaged in transport activities in the urban centres of Eastern Uttar Pradesh. As much as 8.91 per cent of total labour force were found contributing to this function (1971). Transport and communication centres in this region are less numerous than those of any other functional category. Of the 69 towns, only 6 are considered as transport centres and that they are not evenly distributed.

The are classified on the basis of functional specialization intensity and regional ranking. Demographic and socio-economic characteristics and their correlation with the said activity have also been statistically analysed. Transport towns are mostly rail centres. The authors are of the opinion that this is one of the major handicaps in the way of development of eastern Uttar Pradesh.

I. SETTLEMENTS : RURAL

I-2 : 21

K. Z. AMANI AND S. H. ANSARI, Spatial Analysis of Settlements in Gazipur District, U. P., *The geographer*, Vol. XXIX, No. 2, 1982, PP. 36-46, 3 Diagrams.

The present paper makes an attempt to find out the influence of environment on the distribution of settlements in Gazipur district. The formula used here to calculate the spacing of settlements has been taken from Mather, according to which following four categories of spatial arrangement of settlements are recognised: (1) very low spacing (1.05 km), (2) low spacing (1.05-1.60 km) (3) medium spacing (1.60-2.15 km) (4) high spacing (2.15 km).

The authors also have discussed the density distribution of settlements and types of settlements.

Finally, they have found that now-a-days, it is the socio-cultural and economic considerations which are playing a relatively more important role in the establishment of new settlements.

I-2 : 22.

T. N. DUTTA , Identification of Growth Centres in West Dinajpur District, West Bengal, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 22-27, 1 Table.

The present paper attempts to identify the various orders of settlement in West Dinajpur District of West Bengal. Based on a hypothetical level of functions, the paper identifies the present gap of services which are to be provided in order to achieve a balanced settlement plan in the study area.

The author has also identified the various hierarchical orders of central places to be used as nodal points for fostering development opportunities. The author is of the opinion that selection of desirable level of functions has to be based on common experience, rather than on any straight-jacketed function. He has provided a list of functions that are expected to be performed by different levels of central places.

I-5 : 23

B. N. MISHRA, Spatial Pattern of Service Centres in Mirzapur district, U. P., *National geographer*, Vol. XVII, No. 2, 1982, PP. 147-158, 2 Diagrams, 1 Table.

The present paper analyses the spatial pattern of service centres in Mirzapur district of Uttar Pradesh. The author has specifically observed the role of physio-cultural factors and found that the high incidence of physio-cultural constraints has produced an aggregated pattern of service centres leading to the centralized concentration of central functions and services in a few pockets and settlements and leaving a large tract functionally poorly served or blank altogether. In the area of rough and hilly topography, the lack of infrastructure, inadequate transport facilities and the crumpling strain of going to distant service centres for availing even basic and essential services has, however, widened the gap between the rich and poor and the rural and urban. The lack of proper education and training, poor health and hygiene, surging unemployment and starvation are shooting up with dire repercussions. To eradicate the social problems, it has been proposed to upgrade 18 settlements as service centres in unserved areas.

J. SETTLEMENTS : URBAN

J-1 ; 24

K. N. GOPI AND KALPANA M., Urban Informal Activities and Role of Civic Authorities ; A Case Study of Hyderabad city, *Annals NAGI*, Vol. II, No. 1, 1982, PP. 30-35, 7 Tables.

The paper summarises the findings of a survey of the vendors in Hyderabad city in 1980. Vendors form a part of the larger informal sector which has become an almost inseparable part of the urban economies of the developing countries. This is because they provide goods and services at competition prices to the urban poor.

The authors observed that the various aspects of vendor's activities portray serious problems in the efficient functioning of the city. The civic authorities are often silent spectators to its proliferation in various parts of the city. The paper is largely diagnostic and not prescriptive, yet some measures aimed at ameliorating the conditions of the vendors are indicated.

J-1 : 25

SARASWATI RAJU, Indian Perspective on Urban Ecology : Thoughts on Some Familiar Geography, *Annals*, *NAGI*, Vol. II, No. 1, 1982, PP. 22-29.

The purpose of the present paper is to refer to those western studies of Indian cities which use an ecological approach and to indicate some of the problems relating to methodology and interpretation that have arisen. It has been observed that the heavy dependence on statistical manipulation of data in such studies requires a brief comment on the reliability of such data in the Indian context. The author has also tried to present some evidence of the importance of social and political organizations rather than economic factors by looking at the case of Gwalior. Examples have also be drawn from empirical studies of other cities.

J-2 : 26

A. N. SINGH, Trend of Urbanisation in Malwa, *N.G.J.I.*, Vol. XXVIII, Nos. 3-4, 1982, PP. 166-179, 6 Tables, 2 Maps.

The present study is aimed at comprehending the pattern and trend of urbanisation in Malwa Plateau. An attempt has been made

to analyse the spatial and temporal variation of various urban factors such as the functional structure of the urban centres, population, degree of urbanisation, urban rural ratios, progress of urbanisation and the number of urban settlements.

The study reveals that the rate of increase of urban population of Malwa during 1901-71 appears less than that of the state average (+365.33). It was greater only during 1931-31 and 1951-61. The number of towns has constantly been growing in the state from 1911 onwards whereas Malwa registered a decrease in the year 1951. In 1971, the percentage of urban population in six districts of Malwa (Indore, Sehore, Bhopal, Ujjain, Ratlam, Sagar and Mandsaur) was greater (ranging between 24-25 and 62.71) than the average, for the state (16.29). The progress of urbanisation was largely due to rural to urban migration. The higher degree of urbanisation and the faster rate of progress of urbanisation in bigger urban centres may be attributed to their relatively superior location and better developed transport and communication system than those in smaller centres.

J-2 : 27

SHAMSHER SINGH, Prospects of Indian Urbanisation, *Geo, Rev. India*, Vol. XLIV, No. 4, 1982, PP. 63-70, 5 Tables.

The present paper makes an attempt to give an analytic retrospective study of Indian urbanisation perceived with views expressed in various prevalent conceptual frame-works and theories.

Considering distribution of urban population by size - classes, more and more population has been concentrating in class I towns. It is 60.37 per cent of total urban population, as per 1981 census of which 26.90 per cent are residing in 12 metropolitan cities, which too have been maintaining higher growth rates in general. Many of these cities have been growing less than the average urban population growth but the magnitude of growth of urban population in these areas is voluminous making their impact feel on the urbanisation and spatial distribution of it. Also, proportionate number of class I urban areas is less in general in the states where these metropolitan cities are located, if we consider their total number of towns class II and III towns have surprisingly been maintaining almost the same proportions, with slight variations, of urban population since 1901. Class IV, V, VI towns have continuously been losing their share of population, though their numbers have been increasing. The author has suggested the

development of small towns to prevent people from moving towards big urban centres.

J-3 : 28

SIKHA LAHIRI, Pattern of Urban Growth in Burdwan District, *Geo. Review of India*, Vol. XLIV, No. 3, 1982 PP. 24-37, 2 Diagrams, 7 Tables.

An analysis of the trend of urban growth in Burdwan district during this century has been discussed in this paper. This has been made with the help of some empirical urban data like decennial growth rate, percentage of urban to total population, density of population, size and spacing of urban units etc. Within the framework of the analysis the congested areas of the district have been identified. An interesting feature of the analysis is the identification of Durgapur as the least congested place, though it has the largest component of urban population and a fairly high decennial growth rate thereby indicating further scope for urban development.

It has also become apparent that besides the growth of urban centres in the west new centres are emerging in the midst of the recently developed agricultural tract in the east.

J-6 : 29

R.B. SAHARIA, Social Area Analysis of Moradabad City and its Relevance to Future Planning, *National Geographer*, Vol. XVII, No. 2, 1982, PP. 181-187, 1 Diagram, 2 Tables.

The present paper aims at bringing out a social area analysis of Moradabad city and suggest a development proposal to improve its urban environment.

On the basis of population density the city can be divided into three classes: (i) High Density (ii) Medium Density and (iii) Low Density.

It has been observed that social rank of an individual or community is determined by economic power it commands. The analysis shows that 30.7 % of city area and 42.8% of its population come under low social order. About half (48.7%) of the city area supporting 34.4% of its population came under medium social order and only 20.60% of the city area involving 22.8% of its population came under high social order.

J-8 : 30

D. S. RAO AND N.B.K. REDDY, Non Agricultural Activity as Centrifugal Function in a City Region, *Geo. Rev. India*, Vol. XLIV, No. 3, 1982, PP. 16-23, 2 Diagrams, 2 Tables.

The non-agricultural activity is one of the most important centrifugal functions in a city region. This confirms the census criterion that an urban place should have 75% of the male working population in non-agricultural activity. In the present paper, the significance of this aspect as a centrifugal function is highlighted and the distance - decay analysis is attempted.

J-11 : 31

D.S. RAO AND N.B.K. REDDY, Spatial Variation of Social Amenities within the City Region of Andhra Pradesh, *The Indian Geographical Journal*, Vol. LVII, No. 2, 1982, PP. 62-67, 1 Diagram, 2 Tables.

In the present paper, an attempt has been made to calculate the composite index score for all the selected social amenities in a city region at different distances from the centre and it is done for the cities of Andhra Pradesh. The strength and weakness of city-hinterland relationship is studied with the help of distance decay curves of the composite index scores in each city region. It has been found that all the amenities in the city area are well-equipped and they are of higher standard than its rural hinterland. There is no definite relationship between the population size of a city and the standard of social amenities in it. Finally, it has been observed that the standard of social amenities of the hinterland of developed areas is higher than those of backward areas.

L. REGIONALISATION, REGIONAL DEVELOPMENT AND PLANNING

L-1 : 32

A. K. TEWARI, Spatial Aspects of Rural Development in the Indian Desert, *The Geographer*, Vol. XXIX, No. 2, 1982, PP. 26-35. 1 Diagram.

The paper analyses the aspects of rural development scheme in the desert and semi-desert areas of Western Rajasthan. The paper concludes that the desert region of India can be developed to the fullest extent not only by irrigation agriculture alone but also by organising and upranking the non-crop economies and establishing new settlements with varied functions.

L-1 : 33

ARCHANA GAUR, Village Resources and Rural Development : A Case Study of Nunera Jagdev Village (Aligarh), *National Geographer*, Vol. XVII, No. 2, 1982, PP, 159-168, 3 Tables, 1 Map.

In the present paper an attempt has been made to present a complete and clear picture of the resource - use in the village Nunera Jagdev of Aligarh district. The resources of the village have been classified under (a) agriculture (b) water (c) animal (d) industrial (e) human (f) transport and communication (g) health and (h) educational categories.

Some suggestions for the integration of the various resources have also been made keeping the needs of the village as a whole in view.

L-1 : 34

MANAS BHATTACHARYYA, Dynamics of Regional Transformation in West Bengal, *Indian Journal of Reg. Science*, Vol. XIV, No. 1, 1982, PP. 19-34, 7 Tables.

This paper attempts to isolate the factors which determined the hierarchy of different districts of West Bengal in 1971 when compared to those in 1961. For this purpose, the method of principal components analysis has been used in this paper. The paper attempts to explore the possibility of applying this technique in a comparative static framework.

The author has found out that there has not been significant change in the relative position of the districts over the decade. Districts with improvements has been called progressive, districts, those with deterioration in ranks can be called "lagging districts".

Analysing the aspects of industrialization and urbanization the author observed a significant improvement in the collinearity in 1971 over 1961 over the decade, the development pattern remained essentially skewed in nature and there is an increasing tendency towards polarisation.

The development has been concentrated in a few pockets which are located in favourable agroclimatic zones or which have developed industrial base and transport network. Socio-cultural amenities are also concentrated around those pockets only.

L-1 : 35

K. BAGCHI, Transfusion - A Must for the Bhagirathi-Hooghly, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 1-4.

In the present paper the author has discussed the importance of Bhagirathi-Hooghly as compared to Calcutta-Haldia ports and suggested that transfusion is a must for Bhagirathi-Hooghly.

According to author Bhagirathi-Hooghly nestles one of the oldest and still flourishing industrial hubs in Asia, the CMD and dominant part complex of Calcutta-Haldia. Any deterioration in fluvial functioning of Hooghly would affect the balance in world supply of jute textiles, engineering softwares and tea exports, imports of a vast hinterland, comprising the coal-steel belt of India, the mounting requirements of the emerging north-eastern India which is on the threshold of spectacular schemes of industrialisation and urbanisation, the massive ecumene of the great agrarian Nepal and plains of West Bengal, Bihar and U. P. as also the trade links serving Bhutan.

The author stressed the need that the entire stretch from Haldia to Calcutta should be considered as a delicately sustained integrated system and navigational hazards should be attended to on this basis. If one portion of the channel is played up and the other given less emphasis, the hydrological balance will be disturbed. Calcutta will become an inland port like Patna or Allahabad and Haldia although very promising now, will go the same way over the years.

L-1 : 36

S.L. KAYASTHA AND R.S. YADAVA, South Mirzapur Region : A Geographical Analysis of the Development Process, *N.G.J.I.*, Vol. XXVIII, Parts 3 and 4, 1982, PP. 113-126, 1 Diagram, 2 Tables, 4 Maps.

The present study aims at analysing the basis for the rational and optimum utilization of the resources of the region, without endangering the life-supporting capacity of the ecosystem in the interest of man himself.

The authors have considered South Mirzapur Region of Uttar Pradesh as a case study. They have described the geographical personality and cultural and economic aspects of the region. Post-independence development in agricultural and industrial sectors has been discussed. These development projects caused a number of ecological damages such as cultural and agricultural submergence of Sinranti Basin, deforestation and degradation of Dudhi and Ken basins. Deforestation and depletion of soils in Bijul basins. Coalmines, transportation and associated features caused pollution. Displacement of people is always a burning problem.

It is true that the region is passing through a period of investment in techno-industrial development to exploit the natural endowments for economic development of populaion. Unawareness of ecological havoc endangers the man-supporting capacity of the ecosystem. Drought is becoming frequent due to hapazard deforestation.

The authors suggest involvement of people in development projects and maintenance and preservation of the ecosystem to raise the standard of living along with social and cultural changes.

L-5 : 37

L. S. BHAT, Spatial Perspective in Rural Development Planning in India, *The Geographer*, Vol. XXIX, No. 2, 1982, PP. 21-25.

Results of three case studies are presented in this paper to highlight the need for formulating spatial perspective of development taking note of the reality of the socio-economic processes that are opening in these regions. The Hill region of Uttar Pradesh and South Kolaba (Maharashtra) are less developed regions in contrast to the relatively developed Karnal area (Haryana). Scarcity of agricultural land even under sparse distribution of population has perforced out-migration of population resulting in a vicious circle of poverty-outmigration-poverty in the case of U.P. Hill Region and south Kolaba while in Karnal area there is growing evidence of stability and accelerated growth of the economy in its structure and spatial organisation. In the two less developed areas, the concept of regional development through nodality and rural-

urban integration seems to be less applicable under such a situation while in the relatively uniform agriculturally rich area of Karnal, the spatial arrangement of villages and towns is conducive to dispersed development of a nodal hierarchy.

The above examples are suggestive of the need for drawing up spatial development models appropriate to different regions rather than the statement of broad policy issues at the national and state levels.

L-5 : 38

M. JOHN HODGSON, Interaction Based Location-Allocation Models for Indian Regional Planning Background and Potential, *Annals, NAGI*, Vol: II, No. 1, 1982, PP. 8-16.

The paper provides a brief background to location-allocation and spatial interaction modelling, and argues and provides for their synthesis. Alternative locational goals are presented and discussed. The paper further speculates upon the great potential of bringing the knowledge gained from micro-level analysis of Indian regions to bear upon the development of realistic working interaction-based location-allocation models.

The author is of the opinion that the provision of public services such as educational, postal and health facilities constitutes a great drain upon the resources of developing nations. Ideally, such facilities should be readily and equitably accessible to the population as a whole, but budgets are never sufficient to provide completely desirable levels of access to services. Location-allocation models provide a systems-analytic tool for efficient and equitable spatial distribution of scarce resources in any setting and can be especially valuable in the developing world.

Traditional location-allocation models, based upon mathematical concepts of spatial efficiency fail to deal realistically with travel behaviour and accessibility aspirations of those who are to be provided for. Spatial interaction models can provide more realistic representation of these and their synthesis with traditional location-allocation methods can provide more realistic and efficient models for public facility location.

L-5 : 39

SRIKUMAR CHATTOPADHYAY, Regional Variations of Priority Sectors for Economic Development of Kerala, *Geo. Rev. India*, Vol. XLIV, No. 3, 1982, PP. 53-56, 4 tables, 2 Maps.

In this paper, the spatial dimension of the problems and priority sectors of different districts of Kerala, have been analysed. Composite and sectoral index value indicate that all the districts, except Ernakulam, are backward in industry. Idukki, Malappuram and Cannanore have emerged as the districts where all sectors should get priorities.

M. METHODS

M-1 : 40

R. N. SINGH AND AWADHESH KUMAR, Classical Theories of Spatial Organisation, *National Geographer*, Vol. XVII, No. 2, 1982, PP. 89-105, 2 Diagrams.

In the present paper scope and limitations of classical theories of spatial organisation have been discussed. At first the authors have discussed connotations and components of spatial organisation, then they have critically examined different theories. Discussing Von Thunen's model of functional concentration the authors opined that his model explained the organisation of space centred around a single city and is not relevant to a multi-town economy having complex functional diversities, size variation and interconnections. The authors discussed Christallers Central place theory at length and came to the conclusion that inspite of some shortcomings, this theory remains even today unsurpassed as a coherent model of the spatial organisation of human activities. It provides the theoretical and conceptual framework for working out a locational model of central places for the planned and balanced regional development.

It is observed that the Losch's model of spatial organisation applied particularly to secondary activities i.e. manufacturing, where such a complex pattern of specialisation is the rule.

M-1 : 41

S. K. MISHRA AND A. P. SUBUDHI, Cconcordance Analysis for Multicriteria Evaluation of Competing Projects : A Computer Oriented Approach, *N.G.J.I.*, Vol. XXVIII, Parts 3 and 4, 1928, PP. 105-109.

The technique of cost-benefit analysis has been widely used for project evaluation. To avoid the problems involved in coversion of

several criteria into a single criterion, the techniques of multicriteria analysis have been recently developed. Among these techniques, multidimensional scalograms and correspondence analysis are still at primary stages of evaluation. However, a still different technique, namely, the concordance analysis developed by the French School of regional planning has gained considerable popularity and has also exhibited a commendable command over solving the problem of multicriteria decision-making.

The present paper demonstrates the technique of concordance analysis for multicriteria project — evaluation and to study its applicability in regional planning. A special attention has been paid to simplify the computational procedures for a handy application of the technique by the planners.

M-1 : 42

SATYA BRATA GOSWAMI, Contour Model in Thematic Cartography, *Geo. Rev. India*, Vol. XIV, No. 4, 1982, PP. 79-80.

The contour model has the most appropriate and normal use for the large scale mapping to show the surface variations of the continuously varying land. In the present paper the author has identified the elements that influence the contour model of thematic maps.

The contour model for thematic maps has certain limitations also. A thematic map generally cannot show as many isolines as contours on a topographic map can do, because of the comparatively smaller scale and smaller number of input data, and therefore many details of the thematic surface remain obscured from view. Again, an isolined thematic map based on point data is more reliable than the one based on areal data.

Q. GEOMORPHOLOGY

Q : 43

K. N. PRUDHVI RAJU, K.B. MAHALAKSHMI AND R. VAIDYANADHAN, Origin of Kondakarala Lake in Visakhapatnam District, *Photo Nirvachak*, Vol. X, No. 2, 1982, PP. 63-66, 3 Diagrams.

Kondakarala lake is the largest natural fresh water lake in Visakhapatnam district. The lake has been formed in a gently sloping basin partially deepened perhaps by a migrating course of

the Sarada river. Aggradation at the north-western part besides cutting off of the meander loop has created a barrier of low relief resulting in narrow long basin of internal drainage. Neither the structural trend of the hills nor any other features indicate synctinal/anticlinal basins or troughs, ruling out any structural trend for this lake.

Q : 44

NARESH BEDI AND R. VAIDYANADHAN, Effect of Neotectonics on the Morphology of the Narmada River in Gujarat, Western India, *Journal of Geomorphology*, Vol. XXVI, No. 1, 1982, PP. 87-102, 2 Diagrams, 7 Tables, 4 Photographs.

The Cambay graben in Gujarat in Western India is a prominent intercreteneic depression filled up with variegated tertiary and quaternary sediments. The Narmada river flows across this graben along a rift and flows into the gulf of Cambay. For about 91 km of straight valley length it flows over an alluvial plain within which it has evolved very interesting geomorphic features. The different land-forms are delineated, the fluvial and other processes operating in the area are analysed and the general morphogenesis is deduced. Topographic maps, aerial photographs and Landsat imageries on different scales were studied covering an area of about 1800 km². Some measurements were also made in the field.

The geomorphic and tectonic features indicate that the morphogenesis of the present landscape started sometime in the late quaternary period. Paleohydrological changes and neotectonic activity seem to have played an important role in the morphogenesis of the landscape.

Q : 45

PRAKASH PANDA, An Analysis of Slope in Khasi and Jaintia Hills, *Hill Geographer*, Vol. I, No. 1, 1982, PP. 42-46, 1 Diagram, 1 Table.

In this paper, the author attempts an analysis of slope in Khasi and Jaintia Hills (Meghalaya). For determining average slope of the region Wentworth's method has been used. for the sake of analysis the author has taken five categories of slopes (1) gentle (2) moderate (3) moderately steep (4) steep (5) very steep.

Gentle slopes are seen along river valleys and near the mouths of the rivers. Both shifting and sedentary cultivation are done on moderate slopes. Moderately steep slopes are thickly forested. While steep slopes and very steep slopes are prone to gully erosion.

Q : 46

RANJAN RAJKUMAR, Geomorphic Evolution of the Manipur Valley, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 76-78.

In this paper, an attempt has been made to prove that the Manipur Valley exists due to a delicate balance between the rate of upliftment in the south Manipur hills and down-cutting by the Manipur river.

From the geological evidence, the author concluded that the Manipur river existed before the land in the South Manipur Hills underwent upliftment. It is thus partly an antecedent stream. The upliftment in the south led to gradual loss of gradient. Consequently there started a process of sedimentation in its upper reaches. This process was accelerated by the action of the tributary system, more so, by those coming from the opposite direction, *i.e.* from south in the form of obsequent streams.

It is found that the Central Manipur plain is of riverine origin. It was built up as a result of temporary interruption caused by upliftment in the southern part of the Manipur river. The plain exists due to a delicate balance between the rate of upliftment and down-cutting by Manipur river.

Q : 47

R.K. RAI, Geomorphology and Ground-Water Potential of Garo Hills District, Meghalaya, *Hill Geographer*, Vol. I, No. 1, 1982, PP. 68-73, 2 Tables, 8 Maps.

The present study shows the impact of geologic and geomorphic factors in assessing the potentials of underground water in Garo Hills District.

Variables like geology and structural characteristics of rocks, soils, slopes, vegetation, topography, climate and drainage characteristics of rocks have been considered and by superimposing different maps, the authors have tried to assess the potential of underground water in the region, and a groundwater potential map has been prepared.

The author found out that nearly 60 per cent area of the district is covered by Archaean granites which are poor aquifer. Thus the water-bearing capacity is minimum in these rocks. Sedimentary and quaternary deposits are more favourable for groundwater,

Q : 48

SAVINDER SINGH AND R. S. PANDEY, A Geomorphological Study of Slopes in the Adjoining Areas of Nagod, *National Geographer*, Vol. XVIII, No. 2, 1982, PP. 107-120, 3 Diagrams, 4 Tables, 6 Photographs.

In the present paper, the authors have studied the geomorphology of slopes in the adjoining areas of Nagod of Madhya Pradesh.

The authors have applied Wentworth's method to calculate slope angles for frequency and spatial analysis of average slope. The authors have associated slopes with other morphometric variables. Major part of the study region dominated by level and gentle slopes indicate long endurance of slope evolution where in stability of does not warrant any sort of landslides except in the free face zone of the scarp. The region has active element of slope evolution in free face section of hill ranges and escarpments wherein there is active parallel retreat of the free face and gradual increase in scree-dominated concave element. In some localities the scarp retreat has reached its final stage, resulting in complete obliteration and foundation of rounded hills or monadnocks with summital convex and basal concave slope profiles.

R. HYDROLOGY

R : 49

P.G. ADYALKAR, Limestone, Karsts and Groundwater, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 5-9.

According to the author, this is a short story of Karsts, and how it unfolds the mystery of limestones bearing abundant water in our countryside from Kashmir to Kerala, Assam to Rajasthan and stratigraphically speaking from over 500 million years old Bijawar limestones of central India to the Por Bunder limestones of Plio Pliocene age of only a few million years of antiquity.

The author has discussed Karstification phenomenon and hydrogeology of Karst. He came to the conclusion that Karstification is responsible for location and movement of both the confined and unconfined groundwater bodies.

R : 50

R. N. MATHUR AND K. S. YADAV, Influence of Geographical Factors on Hydrological Conditions : A Case Study of Chakia Tahsil, Varanasi, *National Geographer*, Vol. XVI, No. 2, 1982, PP. 121-129, 3 Diagrams, 1 Table, 1 Map.

In the present paper, hydrological conditions of Chakia Tahsil of Varanasi district has been studied and it has been found that geographical factors like climate, relief, drainage and geology are significantly influencing the hydrological conditions in the study area. The monsoonal climatic regime is clearly reflected in the water surplus and deficit patterns, and in the reservoir and well hydrographs. The influence of these factors is reflected in the rates of run-off and infiltration, and in the occurrence, distribution and movement of groundwater. The authors are of the opinion that the area is better-endowed with surface water resources as compared to groundwater resources although there are good prospects of increasing the potential of the latter.

S. CLIMATOLOGY

S : 51

A. SAMBASIVA RAO & V. K. VAMADEVAN, A Climatic Study of Water Availability Periods in Kerala, *Annals NAGI*, Vol. II, No. 1, 1982, PP. 1-7, 4 Diagrams.

The water availability periods at selected stations in Kerala were identified from climatic parameters. The periods were classified as humid, moist, moderately dry and very dry based on the amount of available water in a given week. The percentage frequency of different degrees of water availability periods with their confidence limits were worked out and presented. Though the average rainfall of the state is about 3000 mm the present analysis shows that rainfall is below the potential climatic need for a period varying from 27 to 34 weeks depending upon the location.

S : 52

A. R. SUBRAMANIAM AND A. SAMESIVA RAO, *Water Balance and its Applications to Maharashtra State, N.G.J.I., Vol. XXVIII, Parts 3 and 4, 1982, PP. 134-145, 4 Diagrams, 3 Tables, 12 Maps.*

In this paper, an attempt has been made to investigate the application of water balance in Maharashtra State. For the study, the authors have selected five stations namely Baramati, Poona, Nagpur, Bombay and Vanghrala. They have discussed the climatic parameters like rainfall and variability, water need, actual evapotranspiration and water deficiency as well as climatic shifts, water balance and crops and finally movements of vehicles over off-road surfaces. It has been observed that (1) the state experiences all moist climatic types ranging from arid to perhumid. (2) in the five stations selected for study, climatic shifts are on the drier side (3) humid and subhumid regions are more prone to drought than the remaining part in the state (4) tractionability for the movement of men and vehicles over off road surfaces is poor in the entire state in monsoon season and in the coastal areas all round the year.

The authors are of the opinion that the weekly studies can be of help in crop planning during kharif and rabi seasons and index of the moisture adequacy is a useful tool for assessing the agricultural suitability of a region.

S : 53

B. PADMANABHAMURTY, *Meteorological Aspects of Tourism at Bharatpur, Vayu Mandal, Vol. XII, Nos. 1-2, 1982, PP. 49-52, 4 Diagrams, 3 Tables.*

A knowledge of the climatic patterns at any particular place enables a tourist to plan his itinerary suitably. The present paper gives an account of meteorological aspects of Bharatpur, from the point of view of tourism. Statistics indicate that the maximum tourist activity takes place during the month of December when the prevalent weather is relatively cool. The main climatic elements of interest to tourists in the months of October to March are temperature, humidity and rainfall. In the present study besides these climatic parameters, climograms, wind roses, frequency of

occurrence of winds in different seasons, inversions and pollutions at Bharatpur are also considered.

It can be seen that December is a month of no precipitation, January of low temperature, November of low wind and March of low relative humidity. The tourists can take advantage of the present study in planning their itinerary to see the famous Ghana Bird Sanctuary.

S : 54

D.V. VISWANADHAN, K.P.R.V. MURTHY AND Y. SADHURAN,
An Appraisal of Pasquill-Stability Categories for Two
Major Cities in India, *N.G.J.I.*, Vol. XXVIII, Parts 3 and 4,
1982, PP. 110-112, 5 Tables.

Pasquill suggested a popular scheme for deriving the standard deviations of pollutant distribution as a function of stability and other parameters such as travel distance etc. He identified seven stability categories whose determination has been made more objective by Turner to enable one to find out the stabilities from the routine measurements like cloud condition, wind speed etc. The stability clauses identified are extremely unstable (A) moderately unstable (B) slightly unstable (C) neutral (D) slightly stable (E) moderately stable (F) and extremely stable (G).

In this paper, the stabilities for each hour have been computed for four months for the two major cities of Madras and New Delhi. Only the means of these stability categories have been presented. The average of A, B and C is taken as B, while the average of C, B and D is taken as B. The G and F categories are combined and represented as F category.

During day time slightly unstable conditions and during night time slightly stable conditions prevailed in Madras especially in August and April. Moderately stable conditions during night time were observed in New Delhi except in April where slightly unstable conditions were observed during day time.

While New Delhi showed extreme conditions, Madras showed only intermediate conditions because the former being an inland and the latter being a coastal station.

S : 55

RANJIT SINGH AND C.P. THORAT, Depressions and Cyclonic Storms of the Indian Seas : A Climatological Analysis, *National Geographer*, Vol. XVII, No. 2, 1982, PP. 169-180, 9 Diagrams, 3 Tables.

In the present paper an attempt has been made to study the frequency of the formation, occurrence and dissipation of cyclonic storms in the Bay of Bengal, the Arabian Sea, and continental area of the Indian landmass on the basis of data for the last hundred years (1877-1976). For this purpose the total area 5°N - 35°N latitude and 50°E - 100°E longitude has been divided into three parts. Part I locates the areas of the formation, occurrence and dissipation of these storms, while their genesis has been explained in part II. Similarly, the frequency of the severe cyclonic storms has been discussed in part III.

s : 56

A.S.R.A.S. SASTRI, Y.S. RAMAKRISHNA AND C.S. BHANDARI, Drought Climatology of Guhiya Catchment in Rajasthan, *N.G.J.I.*, Vol. XXVIII, Parts 3 and 4, 1982, PP. 146-148, 1 Diagram, 1 Table.

An attempt has been made in this paper to study the drought climatology of regions in and around Guhiya catchment and the probability of occurrence of droughts.

The monthly water balances of 13 places in and around Guhiya catchment were worked out for the period 1961 to 1976 using the book keeping procedure of Thornthwaite and Mather. The potential evapotranspiration values required for the water balance computations were estimated using Penman's equation. On the basis of the aridity index it has been found that during the period 1961-1976 the severe and disastrous drought years in all the regions were 1963, 1968, 1969 and 1972. The probability of occurrence of drought in various regions of Guhiya catchment varied from 55 to 62 i.e. with a probability of occurrence of drought at least once in two years.

U. BIOGEOGRAPHY

U : 57

JAWEED ASHRAF, Changing Distribution of Wild Animals Between 16th and 19th Centuries and its significance to the Dynamics of Ecological Change in Medieval Hindustan, *The Geographer*, Vol XXIX, No. 2, 1982, PP. 53-62, 2 Maps.

The present paper gives an account of ecological changes in medieval India through the description of changing distribution of wild animals.

Tigers and elephants are not new to India. They have a presence that goes back to the dawn of Indus Valley Civilization. Most of this territory is now devoid of these animals. In Medieval period there are two very authentic reports of personal encounters with another extinct animal, rhinoceros, pointing to very different type of forest that is a logical compulsion of the fact. Ibn Battuta and Babar leave no doubts about the presence of the rhino in the Multan area. It has also been reported in the vicinity of Jaunpur as late as the 17th century. This fact implies dense, humid and subtropical to tropical, permanently green forests with high humidity and probably sub-soil water table, without which rhino is not likely to survive in nature. Tiger requires a warm climate with large amount of water that is easily available. Throughout the Indian sub-continent all types of forests are acceptable to it.

It has been reported that Indus Valley was occupied by tigers as late as 1886 B.C. Tiger hunts of Shahjehan have been recorded in Mathura as well as Panipat. Considering the hard habit, sleeping requirements etc., elephants are to be found only in dense perennial tropical or subtropical forests with heavy rainfall or large supplies of permanent flowing water. There are references of elephant hunting expeditions by jahangir in Malwa region.

The author is of the opinion that changes in land use as well as socio-economic and technological factors are responsible for the disappearance of these animals.

W. NATURAL RESOURCE BASE

W : 58

BIRESWAR BANERJEE, Resource Utilization of Darjeeling Himalaya and Conservation of Ecology, *Geo. Rev. India*, Vol. XLIV, No. 3, 1982, PP. 1-15.

This paper portrays the pattern of the existing use and misuse of the various resources of the Darjeeling Himalaya and suggests measures for their better use and conservation.

Since the beginning of pioneering settlements in early 19th century, the virgin resources of the region are being exploited without any consideration of their use elsewhere. Growth of tea-plantation acted as a nucleus to attract people in the region. The Pristine beauty of Himalayas has gradually made the region a tourist paradise. This naturally has led to the growth of new settlements, farm levels and communication lines. These are being set up without any consideration to their ecological stability. Forests have been indiscriminately cleared resulting in the disturbance in water-balance. Farmlands are being put up without little consideration to the terrain pattern. Such human interferences with nature have naturally resulted in a gradual deterioration of environment, thereby disturbing the eco-system of the region.

The author is of the opinion that the ecological balance can only be restored by scientific use of resources which have immense potentialities for further development in the region.

W : 59

R.N. CHAUDHURY, Morpho-Edaphic Analysis of the Bhagirathi Alakananda Basin of the Garhwal Himalaya, *Geo. Rev. India*, Vol. XLIV, No. 4, 1982, PP. 40-57, 4 Tables.

Of the various districts of Garhwal region of Himalayas only four are taken here for field study viz. Uttarkashi, Chamoli, Tehri and Pauri. The major criterion selected for study are morphogenesis, climate, soils and vegetation of the region. Of the numerous parameters selected for study, river morphology and terrain, water balance and evapotranspiration for climatic studies, nutrient status and pedogenetic properties of various groups of soils and lastly the distribution of vegetation climaxes according to altitudinal zones are considered here. Keeping in view the major handicaps viz. the accessibility along the region, the author has attempted to establish a relationship among these factors stated above.

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B. POLITICAL GEOGRAPHY

B- 1 : 1

SUDEEPTA, ADHIKARI, Geographical Bases of India's Federal Polity, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 162-171, 5 Maps.

A federation is a geographical phenomenon and it develops out of interaction between the spatial structure on the one hand, and the political process and the system on the other hand. A federation is the most geographical expression of all political systems. It is based on the existence of regional diversities and recognizes the claims of component areas to perpetuate their individual characters. The author explaining the need of federation holds the view that the presence of isolated population clusters and urban foci do create a condition for the adoption of federal polity. Federation in India has developed because of its physical disparities, large geographical size, prorupt shape, multicore characteristics, and religious, cultural and linguistic diversities of the component units, and uneven geographical distribution of population and resources.

The author highlighting the points like geography of federation, histogenesis of India's federal polity, choice of New Delhi as a federal capital, geographical base of Indian federation, reorganization of territories and nature of Indian federation observes that federation is best suited to Indian geographical conditions.

(Farasat Ali Siddiqui)

B-4-: 2

SWARNJIT, MEHTA, A framework for the study of District Boundaries, *The Indian Geographical Journal*, Vol. LVIII, No. 1, 1983, PP. 74-76.

A few studies related to this have been done but there is more paucity of studies particularly on intra-state boundaries. Therefore, the main objective of the paper is to present a preliminary framework for designing studies of internal boundaries of Indian states. The one district of Punjab, i.e., Hoshiarpur is chosen as case study. The morphological association and boundary changes of the district are analysed. The former one is studied through Survey of India topographical sheet as the source of secondary information. The latter one is studied to prepare a series of maps each showing specific change and areas lost or gained as a result of changes in the boundary from time to time. Here the main emphasis of the author is

to know the change of boundaries through a series of reports, records etc.

(Farasat Ali Siddiqui)

B-7: 3

GOPAL KRISHAN, "Administrative Geography," *Transactions of the Institute of Indian Geographers*, Vol. V, No. 2, July, 1983, pp. 101-08.

In this paper the author has made an attempt to review the work of various geographers on the unexplored field of Administrative Geography. The author, after reviewing the work done by various geographers, comes to the conclusion that the scope of Administrative Geography has to be defined only in the light of the nature of geography as a distinct discipline and nature of administration as a specific object of study. He is of the opinion that the list of topics for study under Administrative Geography will also be contingent upon the approach – such as, systematic, behavioural, radical or humanistic – one adopts within geography. Theoretically, Administrative Geography should be concerned with the spatial aspects of public administration. It will, in a spatial perspective, examine the administrative institutions including councils, the bureaucracy along with the chief executive and the public finance as well as public relations. The spatial perspective will imbibe three-fold tasks – first, understanding of the spatial variations in all aspects of administrative conduct and content. Secondly, an analysis of the role of administration as a factor in determining the nature of landscape, economy and society of different areas. Thirdly, to examine the administrative spatial structures at the local, regional and national levels.

One obvious development in respect of social sciences has been their gradual transformation from content sciences to perspective sciences. The author argues that Geography always distinguished itself by its spatial perspective but its content has remained quite incomplete. He emphasizes that there is an urgent need to extend its sphere of inquiry to at least those areas which are of vital relevance but have remained largely unexplored.

(Nasim Aijaz)

C. SOCIAL GEOGRAPHY AND ANTHROPOGEOGRAPHY

C-1 : 4

R.D. DIKSHIT AND J.C. SHARMA, Trends End Patterns in Voter Turn-out in Punjab (1967-1980): An Ecological

Analysis, *The National Geographical Journal of India*, Vol. XXIX, Nos. 1-2 1983, PP. 18-29, 1 Graph, 9 Tables, 5 Maps.

Although multiparty democracy entitles every eligible citizen to exercise its franchise in the government making millions of voters fail to utilise their government making powers. It is generally believed that voting turn-out is positively related with the level of socio-economic development. Contrary to this, however, Punjab despite being the most prosperous state in India has shown declining turn-out behaviour. The study reveals that the rate of voting turn-out in the state has been steadily decreasing from 1969 elections onwards. The objective of this paper is to study the voting turn-out patterns in Punjab from 1967 to 1980 with a view to identify the nature of the relationship obtaining between voter turn-out and a set of selected socio-economic indicators.

Systematic and regular opinion surveys are now the predominant form in which voting behavior studies are carried out in most western democracies. In India, however, the ecological approach continues to vie with opinion surveys and behavioural approach as the preferred form of study. Studies based on aggregate data fail to give us true picture of individual voting behaviour. Owing to data constraints as well as the generally low level of political awareness among the electorate, the ecological approach is generally more suitable for such studies in the Indian context.

The present study has been conducted through a set of 15 socio-economci variables. They have been grouped into (a) developmental variables (b) variables of social pluralism and (c) intensive agriculture variables. Voting turn-out has been measured as the percentage of registered voters in each constituency who had actually exercised their voting right. The coefficient of variation of voting turn-out over the last five elections has been progressively increasing. This is indicative of the electoral participation in the state is increasing unevenly.

(Salahuddin Qureshi)

C-1 : 5

A.K. SHARMA, Cultural Evolution and Environment, *The National Geographical Journal of India*, Vol. XXIX, Nos. 3-4 1983, PP. 115-20

The paper analyses the changing patterns of cultural and environmental evolution in mutual interactions and inter-dependencies. It brings out that nature embraces a diversity of life forms ranging from microbes to human beings, all of which form

integral components of the biosphere. There has been a gradual realization of the complex interdependence and fragility of tiny part of the world which allows or sustains existence of the life. The biosphere is the zone of cultural and environmental interaction and evolution. The zone of biosphere is a few thousand feet beneath the surface of ocean to a few kilometres above in the atmosphere. The study invokes that biosphere is the zone of interaction of the three realms of the earth, namely, hydrosphere, lithosphere and atmosphere. There is a tremendous influence of human culture on the biosphere and the impact of the latter on the human culture. The cultural evolution is endowed with interesting facets all of which in turn have affected life as a whole and human civilization in particular. The paper brings to conclusion that right from the stage of Homo Sapiens man has been evolving his culture and in response to the cultural evolution that environment is also undergoing evolution.

(Salahuddin Qureshi)

C-1 : 6

A. ELHANCE, Location of Social Facilities : An Analytical Approach, *Indian Journal of Regional Science*, Vol. XV, No. 1, 1983, PP. 53-58.

Literature on the sources of regional growth, human capital development and basic needs strategies have clearly identified the very crucial role that investment in such social facilities can play in reducing inter and intra-regional disparities (Elhance 1982). Especially in the case of resource deficient developing countries, like India, with persisting and growing spatial and personal economic disparities, it becomes an urgent task to develop rigorous quantitative techniques for assessing the efficiency of past patterns of location allocation and for better informed decisions for the present and future allocation of scarce development resources over facilities and over space consistent with declared social objectives of equality of opportunities.

In developing the models, the following assumptions are made; (i) the spatial unit of analysis is an acceptable region or district with well-defined and identified number of district human settlements. (ii) only a limited amount of financial resources are available for the establishment of the primary schools. These resources need to be utilised in an optimum manner consistent with desired levels of coverage, accessibility or costs for the users of these facilities. Fixed and variable cost estimates are available for different sizes of the facilities; (iii) estimates of demand for primary schooling, by settlement, are available as are the travel times, costs and risk of

moment between any pair of settlements; (iv) primary schooling is provided free of charge to the children.

However, this is the first time, in the author 'knowlege, atleast, that a sythesis of this kind has been attempted.

C-1 : 7

(R.K. Mandal)

A.B.MUKERJI, Dispersal and Resettling of Refugees in Independent India : A cultural-Ecological Model, *The Indian Geographical Journal*, Vol. LVIII, No. 1, 1983, PP. 1-28, 1 Graph, 5 Tables, 3 Maps.

Starting with a brief account of the refugees in Independent India, an attempt is made to examine the success or failure of the efforts made by the refugees to resettle themselves in India. The present study is particularly concerned with Bengali, Tibetan, Punjabi and Ceylonese Tamil refugees. The basic proposition is that when and where there are en masse, involuntary movements of distinct culture-groups, comprising the international political refugee streams, into alien lands possessing different cultures and ecologies, the groups experience enocunters of culture and ecologies in the process of resettling . The form of encounter and the level of the intensity of interaction are influenced by the regional pattern of distribution of the refugee groups. The political refugees among the refugee groups have formed a distinct culture group. All the refugees have got themselves localized in small regions excluding who have been significant to regional development in the positive sense, the others have played a negative role. Finally the author concludes that the Punjabi refugees have emerged as the most well adjusted group followed by the Tibetans. The least adjusted are the Bengali refugees who have experienced a cultural-ecological failure and have suffered governmental discrimination.

(Farasat Ali Siddiqui)

C-1 : 8

A.K. DUTTA AND R.C. DHUSSA, Novelist Sarat Chandra's Perception of Bengalis in Prabash (Foreign Lands) : A Literary-Geographic Study, *The National Geographical Journal of India*, Vol. XXIX, Nos. 3-4, 1983, PP. 188-206, 1 Map.

The study is based on the premise that use of literature as a source material for research is established in geography. The current study is an in-depth attempt on the exposition of literary geographic works

of an Indian novelist. The study is intended to fill a gap which exists in this field of investigation. The study debates that novelist's vivid portrayals of landscapes, cultures and man-made features have been used by geographers to re-create physical, economic or social spaces. Using three approaches of objective observation, phenomenology and subjective-objective synthesis, this paper evaluates the fiction writings of an outstanding Indian novelist.

This paper is organised chronologically into five sections: First, the general references have been made about Sarat Chandra's writings related to Prabash (foreign lands) and the genesis of Probashi migration. Secondly, his objective observations about these lands have been examined. Thirdly, phenomenological aspects of the Prabash and Probashi have been analysed. Fourthly, a synthesis has been made of objective and phenomenological approaches. Finally, a conclusion has been drawn on the significance of literature in geographic use. Use of literature in geographical analysis provides materials for historico-geographical studies.

(Salahuddin Qureshi)

C-4 : 9

M. ANAS, An Aspect of the Linguistic Geography of India, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 14-16.

Linguistic problems in India are not only of recent origin but are political rather than cultural in nature. Linguistic diversity undoubtedly enriches the culture of a country but it can become an obstacle in the process of nation building. A linguistic geographer, in view of the author, should take extreme care that his work evokes national consciousness rather than fans fissiparous tendencies.

One should not forget that the world population speaks 2,796 different tongues, exclusive of millions of dialects. It should also be understood that lingual intolerance is of very recent origin. Although there are traces of linguistic intolerance throughout the evolution of human civilization, it was mostly cultural and not political complication till the 19th century. It was only the outcome of divide and rule policy of British rulers who introduced communal and divisive politics and encouraged the use of 'Hindi' and 'Urdu' as battle cries of communal forces.

The main problem today is to exorcize the demon of suspicion, jealousy and fear from the minds of people and let all cultures flourish. The author pleads with geographers of Indian languages to play their part in this regard. He draws their attention to the fact that the language is two-edged weapon in politics : it may kill the divisive

forces; it may slaughter the forces of unity. He therefore warns that all the studies should be used in sharpening the former edge and blunting the latter.

(M. Farooq Siddiqi)

C- 8 : 10

ANANDI KRISHNAMURTHI, Service Delivery System and Optional Locations of a Service, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 143-51, 1 Table 3 Maps, 1 Graph.

This paper evaluates the locational efficiency of two sets of locations. First set is concerned with the constraint which means there should be one primary health centre located optimally within each of the 65 population blocks in Bellary district of Karnataka. The second set studies the same number of centres located optimally in the district as a whole. The paper evaluates the effect of this constraint on locational efficiency of primary health services as compared to a case where no such constraint on service locations exists.

It is observed that there is a potential gain of five per cent in locational efficiency of health facilities when a decision making behaviour is assumed in which locations are not constraints by regional structure. This gain is due to the changes that occurred in the two optional location patterns. This saving means that geographical accessibility to the health service could be greater if there was no regional constraint optimally in the district as a whole.

(Farasat Ali Siddiqui)

C- 8 : 11

K.CHOUDHRY AND D.D. TIWARI, Problems of Nutritional Deficiency in Rural Areas of M.P. : A Case Study of Rewa Plateau, *T.I.I.G.* Vol. V, No. 2, July 1983, PP. 157-63, 3 Tables.

This paper highlights the problems of nutritional deficiency in the rural areas of Madhya Pradesh with special reference to Rewa Plateau. To find out the nutritional deficiency among the people a dietetic survey was conducted through the oral questionnaire method. The villages were selected on the basis of a systematic stratified sampling method. The questionnaire was canvassed among 507 families, all in rural areas.

The food habits of the peoples of the region seem to have been governed entirely by the local availability of agricultural produce and in accordance with the prevailing customs and food taboos. As a whole, people of the region are vegetarian and their main diet consists of cereals, pulses and seasonally available vegetables and fruits. The authors are of the opinion that the nutrition problems of the people are both qualitative and quantitative. The survey indicated that none of the sample families were taking a balanced diet. The diet was deficient in calories, protein minerals and vitamins. The main sufferers from malnutrition were children. The deficiency in the nutritional level is further aggravated by the prevalent illiteracy among the rural females, faulty selection of the food items and a low purchasing power.

Complete or partial absence of nutrients generally leads to deficiency diseases, such as slow and poor growth, bone deformities anaemia and eye disorders. The authors have given a number of suggestions which can help in mitigating these problems.

(Nasim Aijaz)

D. GENERAL ECONOMIC GEOGRAPHY

D - 1 : 12

T.N. DUTTA AND R.N. CHATTOPADHYAY, A Note on Economic Development and Urbanization in India : An Inter-State Analysis, *Indian Journal of Regional Science*, Vol. XV, 1983, PP. 96-100, 4 Tables.

A state or a region is considered underdeveloped if per capita volume of production of goods and services is less than the national average. In any standard measurement of level of development particularly relating to space, income is taken as an aggregate measure of all kind of production including services but the only indicator of income alone is not adequate to take care of broad sector of the economy on account of a variety of reasons. This calls for selecting a host of indicators representing the whole spectrum of the economy. As the purpose of this study is to relate the levels of economic development with levels of urbanisation the indicators relevant in the context of urbanisation have been chosen. The indicators are : (a) net output per worker in (b) distribution of secondary sector income (c) distribution of tertiary sector income (d) distribution of secondary sector employment (e) distribution of tertiary sector employment.

An examination reveals that the states like Gujarat, Maharashtra, Kerala, Punjab and West Bengal have exhibited higher composite values in terms of levels of development during 1961-71. On further investigation it is revealed that these states have shown higher dependence on secondary and tertiary sector employment which bear direct relationship with the urban activities.

On the other hand, Bihar, Assam, Rajasthan, Orissa, Tripura etc. have recorded lower composite value and it is evident from the fact that these states have shown less dependence on secondary and tertiary sector activities. The same is expected to be reflected in lower levels of urbanization.

(R.K. Mandal)

D - 1 : 13

K.V. CHITTARANJAN, Functional Specialisation of Cities and Urban Growth in Gujarat, *Indian Journal of Regional Science*, Vol. XV, No. 2, 1983, PP. 27-35, 10 Tables.

Urbanization is taking place at a rapid rate in Gujarat. The urban population has grown over 100% as against a growth rate of about 65% of the total population between 1961 and 1981. In 1961 Gujarat had only 25% of its population living in urban centres; the figure increased to 28% in 1971 and further to 31% by 1981. The increasing degree of urbanization over time in Gujarat is thus apparent. Gujarat ranks third among the states in India in regard to urbanization. Thus Gujarat presents a case for examining the relationship between size of cities and urban growth. Urban growth has been measured in two ways. The most commonly used one is the 'instantaneous' method. The other is the continuous method, which classifies towns according to their population at a point of time (a case for instance) and measures over time changes in the various classes of towns without changing the composition of classes. The first method indicates changes in the distribution of urban population differentials in population growth resulting from initial size differentials.

The growth pattern of towns by size class measured in terms of 'continuous' method differs very much from that of 'instantaneous' method. This is due to presence of very few declining towns. The natural tendency of towns has been to grow into or graduate to larger size class and the reverse tendency of big towns deteriorating into small ones has not happened. The growth of towns is related not so much to their size as to their economic character: the economic structure has definite bearing upon the growth of towns and urban

centres. Industrial towns were found to have grown faster than those with a different economic function.

(R.K. Mandal)

D- 1 : 14

L.S. BHAT, Spatial Organization of the National Economy, *Annals, NAGI*, Vol. II, No. 2, 1983, PP. 23-30, 1 Table.

In this paper, which deals with the overall organisation of the national economy, an attempt has been made to highlight the problems of spatial organisation through market towns and their network. Indian economy in its structure and spatial organisation shows sharp contrasts between rural and urban components. This pattern is most likely to continue because large-scale mobility of population cannot be contemplated due to contrasts in physical environment, resource base, language barrier and low levels of literacy.

Agricultural development has been able to bring about changes in the spatial organisation of market towns though such areas are restricted to the level alluvial plains with assured water supply. Regional variations in the levels of development can be measured in terms of the economic structure around nodal centres such as market towns, urban-industrial towns and their linkages. Variations in the levels of development in relation to the spatial organisation of the economy around the market towns and urban centres reinforce the hypothesis that market towns are the basis of spatial integration of economy and narrow the gap between rural and urban or agricultural and industrial components of economy.

The author has concluded that the regional hierarchic system of market centres and agro-industrial complexes and the industrial complexes based on natural resources and existing industrial structure is bound to facilitate the integration of regional development plans in the national framework.

(K.Z. Amani)

D - 2 : 15

B.N. BHATTACHARYA AND K.MAZUMDAR, Changes in the Structure of the Urbanization of Big Cities in India : An inter-Sectoral Comparative Analysis, *Indian Journal of Regional Science*, Vol. XV, No. 1, 1983, PP. 1-18, 9 Tables.

The big cities of the country form the apex of the urban hierarchy of the country. They are the major centres for urban growth as in most of the cases urban areas develop surrounding a big city. On the other hand, suburbs have been developed by the city administrators to solve the city problems. These cities also represent the heart of the administration and culture, and they are industrial centres for the states in which they are located. Hence, it is very essential to study and analyse the structure of these cities over time. Though they may vary in origin, growth pattern, characteristics and labour force structure, some common features will always be represented. From this point of view, it is very meaningful to study the structure of big cities in India, which are the pioneers of urbanisation in India. Here, by big cities, the author implies those cities whose total population is more than a million according to 1971 census of India, namely, Ahmedabad, Bangalore, Bombay, Calcutta, Delhi, Hyderabad, Kanpur and Madras. This paper attempts an intertemporal and inter-sectoral analysis of the occupation structure of the big cities and also a comparative study of the cities.

The time period of this study is 1901 to 1971. Further emphasis has been given to the degree of urbanization using several criteria and obtaining a ranking of big cities according to the degree of urbanisation.

(R.K. Mandal)

D - 7 : 16

S. L. KAYASTHA AND S.N. SINGH, *Tourism in Varanasi City : A Functional Analysis*, *The National Geographical Journal of India*, Vol. XXIX, Nos. 1-2, 1983, PP. 4-17, 3 Graphs, 12 Tables.

The city of Varanasi has been the principal seat of learning, religion and pilgrimage since long. The city is situated in the fertile middle Ganga Valley on the left bank of the northerly flowing holy river forming a crescent which provides a beautiful and natural setting to the city. It is amongst one of the oldest living cities of the world.

Various types and forms of functional attributes of the city related to socio-cultural factors have been taken into consideration at an interval of four years and their changing trends have been tested with statistical measures. The problem of measuring tourism is difficult and rather a complex one. The study considers various phenomena such as mode of travel, type of accommodation sought, the length of stay, money spent on different items and the socio-economic status of tourists. The analysis of the tourists' residence, their profession, income, purpose of visit, age-sex structure, means of

transport in the city and in other parts of India is helpful in understanding the characteristics of tourist behaviour, expenditure pattern and preferences.

These aspects have been tested by statistical measures of standard deviation and Spearman's rank correlation. The study finds out that the economic services in the city are of a satisfactory level. However, the municipal and sanitary services are far from adequate.

(Salahuddin Qureshi)

E. AGRICULTURAL GEOGRAPHY

E - 1 : 17

S.L. SRIVASTAVA, Regional Disparities in Agricultural Development in Madhya Pradesh, *Indian Journal of Regional Science*, Vol. XV, No. 2, 1983, PP. 55-60, 2 Tables.

Agriculture occupies an important place in the economic life of Madhya Pradesh because it provides the key to economic growth, and fluctuation therein has greatly influenced the growth rates in the region. Agricultural development is an essential condition for economic growth of this state. The overall state position conceals considerable regional or districtwise differences because of farming practices, techniques and attitudes of farmers in different parts of the state. The areas having assured rainfall and facilities for controlled irrigation have indicated steady progress, whereas, the areas with low rainfall and poor irrigation exhibit low and unsteady progress. The knowledge of relative performance of the districts in the past serves useful purpose in formulating programmes for balanced regional development.

In this study the agricultural development of various districts of Madhya Pradesh has been calculated by the composite index of agricultural development with the help of the available data to assess the regional or districtwise pattern of the agricultural economy of Madhya Pradesh. Comparison of the economic development of different districts and evaluation of district-wise disparities involve the selection of suitable indicators of development and suitable methods of combining data for several indicators if more than one indicator is selected.

There are ten districts having a lower index than the state average. Then there are eight districts, whose index is between 80 and 90. There are three districts, Betul, Satna and Rewa whose index lies between 70 and 80; and only two districts, Sidhi and Jhabua, are agriculturally the most backward districts of the state. On critically

examination, it is found that there is a high degree of concentration of both inputs and outputs in those districts which are fairly developed.

(R.K. Mandal)

E - 1 : 18

A. MUNIR AND F.A. SIDDIQI, Population Pressure and Agricultural Productivity in Gonda District, *The Geographer*, Vol. XXX, No. 1, 1983, PP. 94-99, 1 Map.

The authors have tried to assess the population pressure and agricultural productivity in Gonda district of Uttar Pradesh. The author have evolved a method to derive functional relationship between agricultural density and the agricultural land productivity. The agricultural density is taken as the index of existing level of employment and food supply pressure on the land. The pressure balance is determined by establishing functional relationship between the agricultural density and productivity.

Based on the residuals obtained by application of the method the authors have demarcated regional pattern of agricultural density and land productivity and then have demarcated and described agricultural population pressure regions.

The overall assessment of the population pressure and agricultural productivity, with a few exceptions, increases with the high degree of agricultural density. The computed residuals from regression of agricultural density on agricultural productivity among the blocks depict that 40 per cent of the blocks are found to be relatively under high population pressure.

(M. Farooq Siddiqi)

E - 1 : 19

A. SAKSENA AND P.N. BHARGAVA : Suitability of Kharif Crops to Agro-Climatic Conditions of Jamnagar : *Annals of Arid Zone*. Vol. XXII, No. 2, 1983, PP. 143-150, 7 Diagrams, 3 Tables.

The paper examines the suitability of kharif crops for Jamnagar district on the basis of the data on productivity of crops, rainfall, evaporation and soil characteristics.

It is observed that cotton crop is more adaptable to the agro-climatic variations than other crops such as groundnut, jowar and bajra. Moisture Availability Index has been applied to find out the normal crop yields. The paper makes a plea for growing cotton and

groundnut as they suit the agro-climatic conditions prevailing in the district.

(Bhim Sen Malhotra)

E-1: 20

B.B. SINGH AND K. RAM, Agriculture-Population Dynamics and Rural Development Typology in Roorkee Tehsil (Saharanpur), *National Geographer*, Vol. XVIII, No. 1, 1983, PP. 115-25, 6 Maps.

In this paper an attempt has been made to examine the triangular relationship between agricultur — population dynamics and rural development, selecting the case study of Roorkee Tahsil of Saharanpur district. The purpose of the paper is to examine and evaluate the role of promoters like agricultural population density, occupational structure and infra-structure in the regional economic set-up and to formulate a scheme of rural development typology based on agriculture-population dynamics in order to suggest spatial sectoral plan priority for economic development of the region.

(Bhim Sen Malhotra)

E-1 : 21

D.B.S. SAHARIA AND M.L. PUROHIT : Crop Returns, Human Employment and Resouce —Use Productivity on Bullock and Tractor Farms in Upper Luni Basin; *Annals of Arid Zone* : Vol. XXII, No. 1, 1983, PP. 29-35, 4 Tables.

In the present study, bullock-and tractor-operated farms were surveyed and data collected for crop returns, labour employment and resource-use productivity in the sample villages of the Upper Luni Basin.

The study reveals that the percentage of gross cropped area under cereals and pulses was increasing and the returns from the tractor farms are higher as compared to bullock farms. On the other hand, there was a 10 per cent decrease in labour employment due to tractorization.

The mechanisation in agriculture has brought about a significant change in the land holdings and in the use of inputs as well as in the cropping pattern in the Upper Luni Basin.

(Bhim Sen Malhotra)

E-1 : 22

G.A. de BRUIJNE, J.J.F. HEINS AND P.J. M. ROBBEN, Agropolitan Development Small Scale Activities and Building in Tamilnadu : Some Theoretical Reflections. *The Indian Geographical Journal*, Vol. LVIII, No. 1, 1983, PP. 71-74

The prime objectives of agropolitan development are three. First, satisfaction of basic needs should have the highest priority, second development should be organized on a territorial base and thirdly, questions of production and consumption should be jointly solved, in relation to one another. Tamil Nadu is being confronted with severe spatial inequalities, both between as well as within urban areas. State government is increasing its efforts to counter-balance these disparities. For this basically a two-tiered approach is adopted that is the control and regulation of the growth of Madras city and stimulation of development of a limited number of second and third-order urban centres. The second order urban centres and a few new centres are being provided funds for balanced regional growth which tends to combine the concept of regional/agropolitan development within the urban subsistence systems.

In this respect, it is possible to focus attention on the field of small scale and cottage industrial activities and to apply these thoughts on dynamics of the structure and organization of building industry. The neglect of subsistence sector has also been criticized by both populists and Marxists.

(Farasat Ali Siddiqui)

E-1 : 23

G. PARIMALA AND M.H. QURESHI, Levels of Agricultural Development in Tamilnadu, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 119-126, 4 Tables.

The main objective of this paper, mentioning briefly the agricultural productivity as the best measure of agricultural development, is to study the spatial variations in the level of agricultural development through dimensions of environment, technology and institutions. The authors firstly selected sixteen indicators from three dimensions and prepared a correlation matrix which indicates only a set of seven indicators to be more appropriate in identifying the levels of agricultural development in Tamil Nadu. Taking the *taluk* as micro-level unit this analysis based on 1972-75 data reveals that there exist large gaps and variations

regionally in the levels of agricultural development among the *taluks* of Tamil Nadu. It is observed that the present study may give a clue to the planners to take necessary remedial measures to minimize the imbalances.

(Farasat Ali Siddiqui)

E-1 : 24

H. G. Bhole, The Cauvery Delta : An Investigation into the History and Determinants of Agrarian Development and Rural-Urban Development, *The Indian Geographical Journal*, Vol. LVIII, No. 1, 1983, PP. 29-46, 2 Tables, 2 Maps.

Present paper investigates the evolution of agrarian economy of Cauvery Delta from pre-colonial period to the recent and discusses the political and economic determinants of agricultural development in the Delta. The basic objective of the study is to gain a thorough understanding of the complex relationship between economic development and rural underdevelopment on a micro-level and from a historical viewpoint. This is attempted under economic and political aspects and the socio-economic aspects. The latter one is further related to the findings of the former study.

It has been observed that the agrarian economy of the Cauvery Delta has developed over the centuries, in a number of clearly marked steps which generally added to the productivity of the 'rice-bowl' of south India. The mechanism of governing this process may be known to integrate over regional observations into a wider economic, political and institutional context. Political and economic forces and motives have been taken in different stages of the process and they have been taken as determinant of specific spatial structure and economic situation of the region.

(Farasat Ali Siddiqui)

E-1 : 25

H. S. R. Mohan and V.P. Suberahmanyam, Application of Water Balance Concepts in Agricultural Planning and Operations in South India, *The National Geographical Journal of India*, Vol. XXIX, Nos. 1-2, 1983, PP. 30-4, 5 Maps.

The increasing demand on agricultural production in recent years has led to vigorous attempts at all possible means of optimal exploitation of available water resources. Agricultural planning of

low rainfall areas, in particular, requires a sound knowledge of the local climate in terms of moisture and thermal regime. Detailed information on the seasonal moisture regime in relation to the thermal regime is, therefore, a pre-requisite of agricultural planning.

The elements of water balance obtained from the book-keeping procedure of Thornthwaite and Mather have been graphically plotted against all the months of the year to present a clear picture of not only the march of water surplus but also water deficiency throughout the year. This reveals accumulations and depletions of soil moisture.

For the computation of the elements of water budget in the region, precipitation has been treated as income, potential evapotranspiration as expenditure and the soil moisture as a kind of reserve for use in times of deficient precipitation. The actual Evapotranspiration and Potential Evapotranspiration values have been computed for all stations in South India for each of the twelve months. The index A.E./P.E. for different seasons expressed as percentage has been plotted and isolines drawn.

This study of water balance approach to agricultural planning and to schedule supplemental irrigation in accordance to water status on a daily basis can open up new vistas for successful raising of crops and for evolving suitable cropping patterns.

(Salahuddin Qureshi)

E-1 : 26

JHUJHAR SINGH, 'Spatial Organization of Agriculture in a North Indian Village, A Deductive Model', *Transactions, Institute of Indian Geographers*, Vol. V, No. 2, July, 1983, pp. 115-26, 2 Maps, 4 Tables.

This paper develops a deductive model of the spatial organization of crops in a north Indian village. North India is characterised with two distinct crop seasons. An attempt has, therefore, been made to develop a separate model for each season. The conceptual model is based largely on the distance-cost relationship. The zonal position of each crop has been worked out with the help of Kendall's ranking coefficient method. The zonal positions of crops have been worked out depending upon their cash value, consumption, transport costs and their physical requirements.

Finally both have been integrated into a modified model which has been tested by taking a case study of village Devinagar Hirasingshwala of Patiala district in Punjab. This study is based on the cropping pattern of 1979-80 and is illustrated with tables and models to show the percentage area covered by individual crops. The author has considered, among other factors, the distance from the settlement, source of water and the approach road and the associated cost of movement of men and materials as the determining factors in the location of crops around the settlement in a village.

(Nasim Aijaz)

E-1 : 27

P.C. AGGARWAL, Spatial Analysis of the Levels of Agricultural Development in Madhya Pradesh, *National Geographer*, Vol. XVIII, No. 2, 1963 PP. 205-13, 2 Tables, 3 Maps.

The object of this paper is to develop a methodology for measuring spatial variation in the levels of agricultural development of Madhya Pradesh.

The notion of agricultural development has a variety of implications both quantitative and qualitative. The author has developed a composite index of the relative levels of agricultural development in the sub-units of the study area on the basis of nine variables whose inter-relationship has been tested by correlation analysis.

(Bhim Sen Malhotra)

E-1 : 28

V. RAGHAVASWAMY, Land Capability Classes, Landuse and population Distribution, *Annals NAGI*, Vol. III, No. 2, 1983, PP. 1-14, 5 Tables, 3 Maps.

This paper aims at analysing the structural inter-relationships between land capability classes, land use and population distribution and at assessing the significance of land capability classes in determining the land use and population distribution patterns in Visakhapatnam tract, located in the north-eastern coastal plain of India. In order to analyse the land capability classes and landuse aerial photographs, landsat imageries, topographic maps, naval and hydrographic charts and census records have

been used. Choropleth maps have been prepared to show inter-relationships among eight categories of land capability classes and fourteen selected population and land use variables. In order to show the population and land use interrelationships multiple correlation analysis and factor analysis have been attempted. Differences within and between regions have been explained with the help of factor analysis. The conclusions based on the analysis indicate that the study area has a rich agricultural base with considerable regional variations in the agricultural landscape. Such a study is very useful in any land use planning of the area.

(K. Z. Amani)

E-3 : 29

G. V. S. RAMAKRISHNA, S. P. MALHOTRA AND M. P. YADAV : Trend and Stability Analysis of Crop Production Efficiency Over Western Rajasthan, *Annals of Arid Zone*, Vol. 22, No. 2, 1983, PP. 157-61, 4 Diagrams, 2 Tables.

The objective of the paper is to study the stability and change in the agricultural efficiency in western Rajasthan over a period of 25 years.

The efficiency indices were calculated by using the Kendall's method, to see the trends and stability of the crop production efficiency.

It is noted that the crop production efficiency in the districts of Western Rajasthan did not improve over the last 25 years except in Ganganagar. Districts with high rainfall are more efficient and stable in crop production than the districts with low rainfall.

(Bhim Sen Malhotra)

E-3 : 30

S. B. SAWANT AND A. GADGIL, Factors Affecting Agricultural Efficiency in India, *National Geographer*, Vol. XVIII, No. 1, 1983, PP. 107-113, 1 Table, 8 Maps.

The Paper deals with the regional variations in productivity and efficiency of agriculture in India. A number of variables have been chosen to explain the spatial variations in agricultural productivity and efficiency which vary from state to state. The study indicates the areas where further investment in agriculture can be made if surpluses of any one factor in a region can be diverted for better and fuller utilization to other regions. The

authors are of the view that the measurement of agricultural efficiency is essential before any steps for improvement are taken.

With this view in mind various socio-economic and technological inputs have been selected and their relationships with productivity and efficiency of agriculture have been studied.

The causes of variation in the level of agricultural productivity and efficiency which have been highlighted in this paper may help in evolving policy measures for areas showing low performance. The authors conclude that if agricultural efficiency of the states like Madhya Pradesh and Rajasthan is raised to the level of the Punjab and Tamil Nadu, the food production will be substantially augmented which will help in the solution of the food problem of the country.

(Bhim Sen Malhotra)

E-3 : 31

Y. V. RAMANAIAH AND N. B. K. REDDY, Carrying Capacity of Land in Andhra Pradesh, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 107-118, 4 Tables, 1 Map.

In the present paper an attempt is made to demarcate the regions of carrying capacity of land in Andhra Pradesh based on Standard Nutritional Unit (SNU) of production in 1979 and 1961, the changes during 1961-79 and the cause of variations. Secondly, the district-wise per capita availability and requirement of gross arable lands under three main points per capita gross arable land available, per capita requirement of gross arable land and surplus and deficit of gross arable lands for the years 1961, 1971, and 1979 are dealt with for the purpose of agricultural planning in the state.

(Farasat Ali Siddiqui)

E-4 : 32

S. B. DESHMUKH AND M. D. TAWADE, Agricultural Planning for Heterogeneous Region, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1963, PP. 191-195, 1 Table 1 Map.

A comprehensive integrated geographic analysis of the package of land resources may lead to identify spatial planning units at micro-level. It may be possible through the indicators of cropping patterns and agricultural productivity. In this paper an attempt is made to find out interaction between physical and cultural factors by an appropriate technique to decide

comprehensive and homogeneous agricultural regions so that problems of small scale planning can be identified and remedies may be suggested. The authors with reference to few works on agricultural regionalization have developed composite index which has been obtained from nine indicators based on taluk level data of Sangli district in West Maharashtra.

The study observes that agricultural situations are different in the taluks. The taluk of highest level of agricultural development needs agricultural planning on providing innovative services and marketing facilities. The taluks of high grade show that efforts are needed in animal husbandry and improved, particularly non-food, cropping pattern. Rest of the taluks being drought-prone need to be encouraged for allied activities. Finally, the study clearly brings forth that geographic heterogeneity has to be looked into before formulating any plans for regional planning.

(Farasat Ali Siddiqui)

E-6 : 33

O. SINGH AND H.C. SINGH, Impact of Consolidation of Field Pattern and Agricultural Mechanisation in Dhanpur Development Block (Varanasi District), *The National Geographical Journal of India*. Vol. XXIX, Nos. 1-2, 1983, PP. 41-49, 4 Graphs, 5 Tables, 5 Maps.

The consolidation operation of fragmented land holdings by government at individual level is perhaps the wisest and considerably effective step as it paves the way for innovations like personal source of mechanised agriculture which engenders a lasting chain of new adoptions by the farmer. As fragmented fields put up hinderances in smooth agricultural operations, the consolidation of holdings is an imperative measure to tackle this problem.

The present paper attempts to assess the positive contributions accruing from the consolidation of holdings towards changes in the field pattern and agricultural mechanization in the study area. The whole of the area is rural in character. The study area is physiographically a homogeneous plain bounded by river Ganga to the north and northeast. The soil is mostly sandy, loamy and clayey.

The inception year of land consolidation in the area was 1970. By 1976 one hundred and ten villages out of a total of one hundred thirty eight were taken up for consolidation. It is noted that from 1977 onwards the progress has been tapering down as only fifteen villages were taken up during 1977-80.

To gauge the impact of consolidation on agriculture in the study area, Family Mechanization Indices and Village Mechanization Indices have been calculated.

(Salahuddin Qureshi)

E-9 : 34

MANJURANI PATNAIK AND JAYANT KUMAR ROUTRY; Intensity of Drought and Spatial Variation of Agricultural Development-A Case Study of Kalahandi District in Orissa. *Transactions, The Institute of Indian Geographers*, Vol. V, No. 2 July, 1983, PP. 165-170, 2 Tables, 2 Maps.

In this paper an attempt has been made to assess the intensity of drought and to relate it with the spatial variations in the levels of agricultural development in the Kalahandi district of Orissa.

Four variables have been selected to study the spatial variation in agricultural development at the block level and a composite index has been worked out. The results indicate significantly low positive correlation between the drought and agricultural development. Thus, it appears that agricultural development in the Kalahandi district is independent of the drought intensity. The assured supply of water can play an important role in reducing the impact of drought. It has been argued that the impact of drought can be further minimised by changing the cropping pattern from paddy to dry farming crops suited to the agro-climatic conditions of the region.

(Nasim Aijaz)

E-10 : 35

SWAPNA BANERJEE AND S. BURMAN, "Input Availability and Modern Agriculture in Burdwan District, West Bengal", *Transactions, Institute of Indian Geographers*, Vol. V, No. 2, July, 1983, PP. 109-14, 3 Maps. 1 Graph.

The failure of green revolution to increase agricultural productivity uniformly has raised serious criticism among scholarly circles. It has been observed that the available institutional structure in India has proved inadequate and unsuitable for a uniform success of this strategy all over the country. The crucial aspect of the success lies in its tremendous investment requirement for a variety of inputs, each equally

indispensable. The inputs are beyond the reach of small and middle farmers. Yet green revolution remains an important remedy to overcome the problem of low agricultural productivity in India. The authors discuss the problems of application of this strategy to Burdwan district, an agriculturally-rich district of West Bengal.

The introduction of high yielding variety of seeds has brought about a miraculous rise in crop productivity within a short period of time. However, these seeds are not as adaptable as the naturally selected ones and hence their susceptibility to a variety of diseases. They need a heavy dose of fertilizers besides intensive irrigation. Moreover, the new variety of seeds needs plenty of nourishment and chemical protection. Obviously, lack of any of the required inputs can lead to drastic decline in production. The authors have concluded that this programme is suited to the large landowners only, as they are better equipped to adopt new technology. They are the major recipients of agricultural credit. The production of crops in the eastern areas of Burdwan district has increased as in these areas rich farmers cultivate new seeds with an optimal use of new inputs. The majority of poor farmers of the eastern areas, on the other hand, are unable to reap the fullest benefit. The authors are of the view that the socio-economic equity between the farmers in the eastern and the western zones needs careful investigation.

(Nasim Aijaz)

E-12 : 36

H. RAHMAN AND A. QURESHI, Pulses in Indian Agriculture, *The Geographer*, Vol. XXX, No. 1, 1983, PP. 75-81, 1 Graph, 4 Tables.

Pulses in India occupy one-eighth of the total cropped area of the country, but the production through time has remained static or has been very small. Important pulses grown in India in order of their areal importance are : gram, moong, urd, kulthi, tur, khesari, masur, peas and moth. Among the states of India Madhya Pradesh, Uttar Pradesh, Rajasthan and Maharashtra top the list in area and production of pulses in the country. Some states have recorded a slight increase in the seventies while some have registered a decrease in both area and production. In general there is stagnation in area and production of pulses.

The per capita availability of pulses in the country has gradually declined from 70.4 gms per day in 1956 to 61.6 gms in 1965, 50.8 gm in 1976 and to 44.8 gms per day in 1979. This tendency of decline in pulses availability is a matter of great concern and India has to chalk out a strategy to increase the production of pulses to

about 19.2 m. tonnes presently and to 24 m. tonnes by the turn of the century to provide minimum pulses requirements of the people.

The authors are optimistic about the potential that exists for a rapid increase in pulses production. It may be achieved through increasing the yield per hectare with the help of improved cultivation practices, use of high yielding varieties of seeds and by adopting crop protection measures. Other suggestions put forth by the authors relate to declaration of support price by the government not below the corresponding harvest price, procurement by governmental agencies to ensure stability in pulse production, application of crop insurance scheme especially in pulse growing states and changing the general ethos of pulse cultivation practice in India.

(M. Farooq Siddiqi)

E-12 : 37

M. SHAFI, Trends in Area and Production of Foodgrains in India, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 1-13, 1 Table, 8 Maps.

The production of foodgrains in India has increased from 55 million tonnes in 1950-51 to 129.8 million tonnes in 1980-81. Likewise the area under foodgrains has also increased from 97 million hectares in 1950-51 to 126 million hectares in 1980-81. The area during the period under study has recorded few yearly fluctuations but the production has shown great variations from year to year. During the first decade (1951-60) both area and production have risen almost at equal pace. The increase in the second decade (1961-70) was of the same pace with respect to production but the rate of increase in area was somewhat slow. In the third decade (1971-80) however the area became static while production continued to increase at accelerated rate.

The author has examined the trends in area and production of wheat, rice, jowar, bajra, maize, and pulses individually during the period 1950-51 to 1980-81. Over a period of 30 years the production of wheat has increased five-fold, that of rice by one and a half times and of jowar and bajra taken together by 80 per cent. The position of pulses is alarming because they have recorded an increase of only 22 per cent during the thirty-year period under study.

The per capita availability of foodgrains in terms of actual grain quantity and calories obtained increased initially in the first two decades but declined sharply in the decade ending 1981. It is

suggested that the area under HYV of wheat and rice be increased along with supporting services on a large scale. The area under pulses should not only be increased but new varieties giving much higher yield should also be adopted.

(M. Farooq Siddiqui)

E-12 : 38

M. S. RAO AND K. KALAVATHI, Water Balance and Cropping Pattern in Madurai District, Tamilnadu, *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 172-82. 1 Graph, 2 Tables, 4 Maps.

This paper attempts to study the various elements of water balance-precipitation, potentia-levapotranspiration, actual evapotranspiration, moisture adequacy, water deficit, water surplus, aridity index and moisture index in Madurai district. It also discusses the concentration of selected food crops and non-food crops. For the measurement of concentration Bhatia's Method is applied based on data of crop acreage for the year 1976-77 at the block level.

It is concluded that in the areas where there is high water deficit dry food crops and oilseeds are cultivated and on the slopes of hilly terrain where water is surplus cardamom, coffee, rubber, fruits and vegetables, banana and forest products are obtained. In the areas of water supply by canal, paddy, sugarcane and banana are produced.

(Farasat Ali Siddiqui)

E-12 : 39

T. S. SHARMA AND O. COUTINHO, Growth of Irrigation and its Impact on Crop Landuse and Crop Yield in Karnataka, *Annals, NAGI*, Vol. II. No. 2, 1983, PP.13-22. 3 Maps.

This paper evaluates the trends in the growth of irrigation in Karnataka in relation to crop landuse and crop yields. Cropping pattern in India has changed as a result of extension in irrigation facilities. The application of new technology in the development of agriculture has been made possible as a result of assured water supply. This is obvious from the fact that most of the highly successful green revolution areas are also high irrigation intensity regions.

This paper makes an attempt to assess the growth of irrigation and its impact on crop landuse and crop productivity in the state of Karnataka during the period 1960-61 to 1976-77. The study shows that irrigation was given high priority in the economic

development of Karnataka. However, the increased irrigation facilities are inadequate because they are not able to provide a protective cover to crops or to raise productivity. In Karnataka only 12 per cent of the net sown area is under irrigation whereas the total potential is about 52 per cent.

Multiple cropping together with increase in yield are two important conditions for maximising production. The study shows that in areas of low rainfall irrigated area does not lead to a considerable increase in the cropping intensity. However, the increase in irrigation facilities indicates a clear shift in favour of more remunerative crops such as maize, wheat and sugarcane and low yielding, mostly inirrigated, crops were the losers in the process.

The study concludes that the bulk of the created potential in irrigation has been used for raising a few intensively irrigated crops while the low-yield crops have been neglected.

(K. Z. Amani)

F. INDUSTRIAL GEOGRAPHY

F-1 : 40

M. K. SHARMA AND R. S. BAWA, Sources of Inter-District Variations in Industrial Development in Punjab, *Indian Journal of Regional Science*, Vol. XV, No. 2, 1983, PP. 46-54, 2 Tables.

The regional disparities in industrial development are more pronounced in the developing countries because they are in the initial stage of industrialisation. This is partly due to the lack of resources and partly due to the tendency to locate new investment in the easy areas or in areas which could generate some pressure on the decision makers. In India disparities in the industrial development are immense. Historically, the cities of Bombay, Calcutta, Madras etc. had large industries and this resulted in the concentration of industries around these cities. Lately, there is growing awareness for balanced regional development and decentralized planning is assuming importance. Keeping this in view, a study is called for a look into the factors which are responsible for inter-regional disparities, so that efforts can be made to remove disparities between the regions.

The present paper pertains to Punjab state and its districts have been taken for studying the industrial disparities. Punjab has been chosen for this study because it had made tremendous progress in agriculture and has provided the lead to the country in the domain of agriculture by spearheading the green revolution.

However, lately, the rate of growth in agriculture has tended to saturate, underlining the need to diversify the economy in favour of industrial sector. Hence there arises the need to examine the source of variation in the industrial development between the districts of Punjab State. It is essential to identify the factors which are responsible for these variations as well as those determining the level of per-capita industrial output. Once these factors are isolated., these can be provided and brought to a level most conducive to the growth of industrial development in the state.

(R. K. Mandal)

F-1 : 41

NEERA, RAMCHANDRAN AND H. RAMACHANDRAN, Regional Pattern of Manufacturing Towns in India, *Indian Journal of Regional Science* Vol. XV, No. 1, 1983, PP. 28-37, 8 Tables.

India's concern for industrialisation is justified by the fact that "the pattern of regional growth will predominantly be influenced by where industry gets located". One may restate this observation stretching it to fit 'industrial activity clusters' (manufacturing towns) as the pattern of distribution of these over space will influence regional economic growth patterns. Industrial activity has a tendency to cluster in space. This characteristic of the industrial sector has significant impact on the spatial balance of economic growth. However, the degree of clustering may be different in different parts of the country. It is worthwhile, therefore, to identify the spacing and distribution pattern of manufacturing towns on a regional basis. Initially, therefore, the study calls for the classification of manufacturing towns, and the identification of distribution patterns. The spatial pattern of manufacturing towns are closely associated with a variety of factors. An attempt is also made in this paper to identify (a) the nature of raw-materials which determine the distribution of manufacturing towns e.g. heavy raw-materials-based industries tend to cluster, (b) in an underdeveloped economy higher level of development is attained through the concentration of industries (reflected in the concentration of manufacturing towns) in a limited spatial unit — thus a clustered pattern is associated with a higher level of intra-regional disparities and vice-versa. The distribution pattern of industrial activity cluster is found to be an important factor in explaining regional imbalance in economic growth.

F-1 : 42

S. KAUR AND K. C. CHANDNA, Changes in the Industrial Structure of India's Male Working force 1961-81.

Population Geography, Vol. V, Nos. 1-2, 1983, PP. 87-104, 2 Tables. 3 Maps.

The present paper intends to examine the magnitude and direction of shift of male workers from one industrial category to another during the decades 1961-71 and 1971-81. The postulation is also made that this index of change is positively correlated with the index of diversification of economy, degree of urbanization, standard of literacy and education, and degree of commercialization of agriculture. In this paper district is chosen as unit area, the changes in industrial structure during 1961-71 are discussed in detail and a brief reference to the changes during 1971-81 is made.

After an overall assessment the authors find that during 1961-71 the country displayed low index of change in industrial structure of its male working force. The areas of low index of change experience the developments only in the field of agriculture and vice-versa. During 1971-81 the country displayed higher index of change. It may also be pointed out that the accelerated change in industrial structure during 1971-81 is largely associated with the development of non-agricultural sector of the economy. There has been a conspicuous shift from agricultural to non-agricultural sectors which signifies that the country has developed an infrastructure for the rapid expansion of secondary and tertiary sectors which might be reflected in the changes in the coming years.

(Farasat Ali Siddiqui)

F-2 : 43

AMAR SINGH. *The Patterns of Industrial Location and Environmental Pollution in the National Capital Region*, *National Geographer*, Vol. XVIII, No. 1, 1983, PP. 68-76, 3 Graphs, 4 Maps.

In this paper an attempt has been made to analyse the environmental problems associated with the industrial growth of Delhi and other industrial centres situated within the National Capital Region. Only those cities have been taken into account which had more than 5000 workers engaged in manufacturing industries. There were 3,053 registered industries and 210,562 industrial workers in these cities according to the official records. Main industries found in the region included food processing, sugar, textiles, paper and pulp, leather goods, pottery, iron and steel and its products, rubber and plastics, chemical, glass, general engineering, electricals, electronics, transport equipment and sugar. Maximum

concentration of industries was found in the city of Delhi itself followed by Faridabad, Ghaziabad, Modinagar, Meerut and Sonapat. The number of industrial workers has increased phenomenally during the last 35 years the percentages being 153.3 per cent for Sonapat and 17.230 per cent for Ballabgarh. There is a well-marked pattern of decreasing industrial activity with increasing distance from Delhi. Nine industrial areas with infrastructural facilities have been developed. The author suggests that in order to reduce the risk of pollution it is necessary to shift the obnoxious industries away from the residential areas of these cities. Thus grouping of industries under nuisance, obnoxious or hazardous and non-nuisance categories is essential. The author feels that people should be made conscious of industrial pollution and adequate training should be imparted through mass media to maintain ecological safety within the city.

(Harjit Singh)

G. GEOGRAPHY OF TRADE AND TRANSPORT

G-8 : 44

V. V. N. SOMAYAJULU AND S. MOHANRAJ, Passenger Traffic Demand in Hyderabad-Secunderabad, *Indian Journal of Regional Science*, Vol. XV, No. 1, 1983, PP. 76-88., 14 Tables.

The objective of this study is to project the demand for passenger travel by mass transit modes of transport vehicles for public use only in the decade 1981-91. The demand for travel constitutes derived demand as an input into other inputs. Travel/journey is an input into man's socio-economic activities, growth in which is responsible for a derived demand for travel. The journey/trip undertaken for the pleasure of travel alone, constitutes the direct demand which, of course, is not so significant as to be considered distinctly in the analysis. Total mobility or need for travel in an urban unit depends upon various factors such as size of population, residential dispersal, number and spread of activity centres over space. Besides rail and road net work themselves contribute to people's mobility since improvements in them increase people's mobility through improved accessibility. The pattern of urban mobility or the model distribution of demand for travel reflects the passenger's choices, preferences and taste unless supply of a mode of travel is a constant.

The estimates of number of bicycles by type of use upto 1980-81 are based on the assumption that the bicycle - population ratio observed in 1970-71 has been constant since then. Demand for

travel by buses run by SETWIN is based on the assumption that its relative share in comparison to RTC will remain the same.

Once the planners have the forecast of total demand for mass travel by such modes of road/rail transport, they can efficiently decide regarding composition of different vehicles to be plied on roads/rail in future, taking into account the impact of such composition on various problems connected with urban transport system.

H. POPULATION GEOGRAPHY

H-1 : 50

K. M. KULKARNI, The Influence of Physical and Social Attributes on Municipal Expenditure in Gujarat, *Annals. NAGI*, Vol. II, No. 2, 1963, PP. 31-38. 8 Tables.

In this paper an attempt has been made to evaluate the role of a selected set of physical and social attributes on municipal expenditure in the towns and cities of Gujarat. The process of urbanisation in India is in favour of class I towns., which accommodate nearly 55 per cent of India's urban population. Gujarat ranks third among the states of the Indian union with 31 per cent of urban population next only to Maharashtra and Tamil Nadu. The concentration of urban population in a few large cities causes heavy burden in local finances and other urban amenities. More than 70 per cent of the population of Gujarat is settled within the jurisdiction of 55 municipal bodies. All these facts reveal the spatial imbalance in the distribution of urban population and equally so in terms of size-class of towns. The difference in the size of population, urban area and also shape of urban area have influenced positively the per capita municipal expenditure as well as the cost of living. The study makes an attempt to analyse the influence of physical and social attributes especially the size of urban area, shape of urban area, altitude from mean sea level, size of population and density of population in the type and magnitude of municipal expenditures. The study identifies certain critical limits in terms of population, urban area, density and altitude from mean sea-level for restricting per capita municipal expenditure. The paper attempts to suggest an optimum size of urban centres in terms of above mentioned attributes and with the prime objective of minimising the per-capita municipal expenditure.

H-1 : 51

(K. Z. Amani)

K. GUPTA, Population Growth, Resources, and Environmental Problems : World Situation and Prospects : *Environmental Management*, 1983, PP. 105-122, 9 Tables.

The present paper aims at analysing the existing situation of the world's population growth in relation to the two most basic resources of mankind - land and food, and their future prospects. Attempt has also been made to discuss some of the problems created for the man's natural environment either due to continuous and rapid rate of population growth or due to continuously increasing affluence and standard of living.

The author has discussed the growth rate of world population briefly. She also mentions that the population and population age structure are unevenly distributed, and fast increasing concentration of population is recorded in urban centres. The increasing trend is going to create serious environmental problem even in developing countries and moreover, it demands serious attention by demographers, environmental scientists and planners. It may be inferred that solution of the problem lies not merely in reducing high population growth rate but in changing the attitude of people towards the natural environment.

(Farasat Ali Siddiqui)

H-1 : 52

K. R. MURTHY AND N. U. RAO : Female Education, Modernity and Fertility : A Study in the Indian Context. *Demography India*, Vol. XII, No. 1, 1983, PP. 86-97, 3 Tables.

In this paper, the concept of modernity is the main focus of attention. The concept has been borrowed from the western world and applied to the Indian situation. The present study investigates the influence of female education and modernity on fertility at both theoretical and practical levels. At the theoretical level, the paper deals with the effect of education and modernity on fertility by taking into account the standard demographic and socio-economic characteristics, at the practical level, the measurement of individual modernity has been attempted. The authors feel that most of fertility surveys in the past have neglected it.

A correlation analysis has been attempted to trace out the degree of dependability of fertility upon modernity and education.

(Bhim Sen Malhotra)

H-1 : 53

U. C. MISRA AND S. K. SHARMA, Population Growth and Agricultural Changes in M. P: Spatial Analysis of Their

Correlates, *National Geographer*, Vol. XVIII, No. 2, 1983, PP. 141-52, 1 Table, 12 Maps.

This paper examines the relationship between population pressure and agricultural change in Madhya Pradesh. The growing population exerts considerable pressure on the economy of a region. In countries of the developing world, the rapid increase in population has not only led to enormous stress on food resources but also resulted in draining out of foreign exchange for the import of foodgrains. That is why, rigorous efforts are being made to augment local food production by introducing new agricultural technology.

The spatic-temporal pattern of changes in the population growth in the state from 1901-1981 have been traced along with the changes in agricultural production and practices.

Changes occuring during this period in the agricultural sector have also been discussed.

(Bhim Sen Malhotra)

H-2 : 54

B. K. ROY, Redistribution of Population in India : Some Reflections. *Population Geography*, Vol. V, Nos. 1-2, 1983, PP. 81-86, 4 Tables.

The present paper examines some aspects of redistribution of population in India on the basis of internal migration data provided by the 1971 census. This work is the outcome of a rigorous analysis of data relating to the place of last residence and duration of residence statistics. The author observes that the increase in rate of female migrants is higher than that of the male migrants in both rural and urban areas. The redistribution of population at the state level which reflects the supply and absorption capacity of different areas in terms of employment opportunities shows that the less developed or exceptionally densely populated states record excess of outflow over inflow. These states are Kerala, Bihar, Uttar Pradesh, Andhra Pradesh, Rajasthan, Tamil Nadu and Himachal Pradesh. It is obvious that female migrants are in higher proportion than males in all streams in terms of intra-district, inter-district and inter-state streams. The rate of rural to rural migration has remained stable but rural to urban migration at the inter-state level has shown a declining trend.

(Farasat Ali Siddiqui)

H-3 : 55

SWARNJIT : MEHTA AND G. KAUR, Rural-Urban Differences in Sex-Ratio of Rajasthan, *The Indian Geographical Journal*, Vol. LVIII, No. 2. 1983, PP. 152-61, 4 Tables, 3 Maps.

The aim of present paper is to study tehsil-wise rural-urban differences in sex ratio of Rajasthan in 1971. The disparity in sex ratio is of greater interest to geographers because of the contrasting roles played by two sexes in economy and society. Besides, the sex ratio differences also reflect effectively the migration differentials between different areas. The authors observe that the difference is usually large in areas characterised by large - sized urban centres and the areas where growth of urban population has been relatively rapid in the recent past. The decadal study of sex-ratio highlights that in each successive decade the sex ratio differential has been slowly tilting in favour of rural areas. In conclusion, it is pointed out that the state is characterized by relatively low sex-ratio which is still lower in urban areas. The urban sex ratio has been found to be higher in areas characterized with predominantly small and stagnant towns and in those where the Marwaris, the Jats and the Rajputs are preponderant. On the contrary, urban centres with cantonments, mining and industrial centres and main educational centres have reported significantly lower sex ratios.

(Farasat Ali Siddiqui)

H-6 : 56

L.R. SINGH AND R. SINGH, Population Density Patterns in the Cities of Bihar, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 17-36, 2 Graphs, 2 Maps.

The present paper is an attempt to analyse population density patterns in nine cities of Bihar in the light of the negative exponential model. It has been observed that the geographical, historical, economic and social factors have been mainly responsible for existing patterns of spatial distribution of population in the cities of Bihar.

The study of density graphs reveals that the cities characterised by single predominant population centre have steeper gradients than those having bi-nodal population profiles.

The city of Jamshedpur, owing to its planned development from the very beginning, has in general low population density as compared to other cities of Bihar. The smaller cities have steeper

population density which flattens gradually with the increase in size through time.

The densities in the cities of Bihar are not as high as in the large Indian cities. Multi-storeyed houses are not seen in large numbers in medium and small size cities. But the single and double storeyed houses have now been converted into multi-storeyed ones owing to the lack of horizontal space.

(M. Farooq Siddiqi)

H-7 : 57

S. NANGIA AND M. J. SAMUEL, *Determinants and Characteristics of Female Migration : A Case Study of Salem City in Tamilnadu Population Geography*, Vol. V, Nos. 1-2, 1983, PP. 34-43. 4 Tables.

The present study is a micro-level analysis of female migration to the industrial city of Salem in Tamil Nadu. It is important due to large number of female migrants engaged in workforce. The aim of this paper is to investigate the reasons which caused females to migrate to the city and examine their educational attainment and work status before and after migration. The study is based on the primary data collected during 1980-81 for nearly one per cent of the total households in the city of Salem. A random sample of 521 male and 481 female migrants was surveyed and analysed on the basis of a classification related to the reasons of associational, marriage, distress and voluntary migration.

The study reveals that females outnumbered males in associational, marriage and distress migrations both in rural-urban and urban-urban streams. Illiterates were found to be maximum in associational and marriage migration and a high level of education attainment was found among voluntary migrants. The work-status of female migrants from rural or urban areas is highly diversified. However the majority of them consists of housewives and has joined their earning members. The share of working women is not negligible but in most cases present work-status is achieved after migration.

(Farasat Ali Siddiqui)

H-7 : 58

M. SIVAMURTHY AND A. S. KADI, *Inter-State Migration in India, 1961-71, Demography India*, Vol. XII, No. 2, 1983, PP. 239-58, 11 Tables.

The authors point out that inter-state migration in India is of considerable interest in view of significant regional variations in socio-economic conditions, cultural characteristics and linguistic differences. The female migration is one important aspect, because of its demographic, geographic and socio-cultural significance.

The authors have analysed the inter-state migration pattern during the decade 1961-71 based on 1971 census data. Migrants are identified on the basis of the last place of residence. The use of data on last residence appears to remove limitations of the studies based on the place of birth. This makes it possible to analyse the 1961-71 decadal inter-state migration with regard to its volume, direction, pattern and the characteristics of migrants more precisely than was possible. The inter-state migration of males and females is analysed with respect to different types of movements, viz., rural to rural, rural to urban, urban to rural and urban to urban. Net flows, origin and destination and sex composition of migrants etc. are examined and their socio-economic and geographical implications are discussed.

The authors conclude that states that have gained population through migration are generally better placed economically than those which have lost population through migration.

(Bhim Sen Malhotra)

I-6 : 59

L. R. SINGH, Spatial Planning For Rural Markets in India, *National Geographer*, Vol. XVIII, No. 2, 1983, PP. 193-204, 5 Tables.

This object of this paper is to examine the relationship between economic development of a country/region and the spatial organisation of marketing systems. India is essentially a land of small rural markets and small farmers and there is an ecological relationship among habitat, economy and society in rural India as reflected in the patterns of seasonal cycles of production, consumption and distribution as regulated through the market mechanism.

The approaches towards the development of rural markets are also discussed along with the prevailing system of rural marketing in India where traditional periodic and modern regulated market systems co-existed. The paper also examines the role of locational factors in the development of rural markets, and suggests that suitable physical facilities be provided to these markets.

(Bhim Sen Malhotra)

J. SETTLEMENTS : URBAN

J-1 : 60

K. P. R. VIRTALMURTY AND R. BHARGAVI, A Comparative Study of the Pollution Potentials of Two Urban Centres in India, *The National Geographical Journal of India*, Vol. XXIX, Nos. 1-2, 1983, PP. 1-3

The present study attempts to highlight the pollution load bearing capacity of different environments. The pollution index mainly refers to the atmospheric pollution. In the present exercise the air pollution potential is estimated for the year 1963 for Bombay and Jodhpur using the data collected from Indian daily weather report and using the lowry and Reiquam index. The two selected stations represent the humid coastal atmosphere of Bombay and arid continental atmosphere of Jodhpur.

Air pollution due to rapid industrialization and urbanization has been of great concern to scientists and environmentalists in view of its deleterious effects on man and nature.

The pollution potential reveals interesting aspects of Bombay and Jodhpur as the two stations are quite contrasting in their physical and meteorological characteristics. Pollution potential is high in winter season and low during the monsoon season. The low pollution potential in the monsoon season could be attributed to the strong instability and vertical ventilation which tends to reduce the pollution potential in the monsoon season could be attributed to the strong instability and vertical ventilation which tends to reduce the pollution potential the study finds out that Bombay is a suitable area for industries because it is a coastal area and the air gets well mixed in a vertical plane to dissipate the pollutants. In contrast Jodhpur shows signs of less load shedding capacity in terms of pollutants. This is obviously because the continental and relatively stable atmosphere of Jodhpur cannot so quickly disperse the pollutants.

(Salahuddin Qureshi)

J-1 : 61

R. S. DIXIT, Sunday Through Saturday Market Centre in the Umland of Kanpur Metropolis. *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 196-97.

The Umland of Kanpur metropolis is generally composed of the eight districts of Uttar Pradesh - Unnao, Kanpur, Farrukhabad, Etawah, Fetehpur, Jalaun, Hamirpur and Banda. The economy of the

region is largely agricultural one and the Bundelkhand region is relatively backward, owing to its considerable variations in the physical and cultural environment. In this Umland 1386 market meetings are held. The two sub-divisions of Umland (the Ganga plain and the Bundelkhand region) show much disparity in the case of day-wise distribution of market meetings. In such type of meetings Thursday is the most important day of the week in the study region. The maximum number of meetings on any week day among the taluks varies between 15 and 23. Such variations are characterized by the Hindu and the Muslim population. In some areas the religious activities have also affected the market opening days. Friday is the most favoured day of the Muslims while Tuesday is favoured by the Hindus. The service class people like to make shopping on Sunday as they are free on the day. However, Tuesday seems to be popular day for market meetings.

(Farasat Ali Siddiqui)

J-1 : 62

S. WANMALI, Service Provision, Spatial Intervention and Settlement Systems, The Case of Nagpur Metropolitan Region, India, *Annals, NAGI*, Vol. III, 1983, PP. 27-65, 2 Graphs, 14 Tables, 9 Maps.

This paper examines the role of Nagpur in the provision of services, spatial interaction and in modifying the settlement system within its metropolitan region. Large towns and urban agglomerations are to a considerable extent responsible for the transformation of the countryside in India. The strengthening of the urban core with adequate facility is, therefore, considered a viable strategy for rural development.

Services are provided in a typical region in India by two major agencies : the government and the private sector. The government provides these through a network of institutions created for this purpose and within the framework of its development programmes. The private sector provides the services through shops and establishments which are located in areas in response to demand for them.

The paper makes an attempt to describe and examine the geographical distribution and impact of service provisions in the rural areas of a metropolitan region with empirical evidence from one of the metropolitan regions of Maharashtra. An analysis of the

data at two points of time on service provisions and use in 262 villages and four towns of the Nagpur Metropolitan Region reveals that the pattern of service provision has substantially improved over the years 1969-1979 and that this has resulted in increased accessibility to services and service centres and in the emergence of new service centres even in the rural areas of the metropolitan regions.

(K. Z. Amani)

J-1 : 63

V. S. PHADKE, Spatial Disparities in Socio-Economic Infra-Structure in the Bombay Metropolitan Region, *Indian Journal of Regional Science*, Vol. XV, No. 1, 1983, PP. 48-52, 3 Tables.

This paper brings out the backwash effect of a metropolis but does not emphasize centrifugal tendencies if any, as they are primarily inter-regional rather than intra-regional in character. The metropolitan regions of the port cities show an accretion of functions on the periphery of the city and the hopes of generating growth impulses in the immediate hinterland have been belied. The primary purpose of this paper is to highlight the spatial variation in socio-economic infra-structure in the metropolitan region of one of the premier port cities of India. The previous study of the area (Sita and Phadke, 1982) has brought out spatial variation in the availability of services. In the paper, which is an extension of that study, an attempt is made to measure the extent of variation between different parts of the region. Hence the main thrust of the present paper is to quantify the extent of spatial disparities in the availability of various central services.

This study area consists of Bombay Metropolitan region, excluding Greater Bombay. The total number of settlements in the study area is 1109, but 63 of these settlements are uninhabited. Of the remaining, 1020 are rural and 26 are urban. The data have been compiled on settlement basis. The regionalization has been done, which provides an objective basis to differentiate the area into three zones : (a) the urban core (b) the fringe and (c) rural rimland. There is a marked disparity in the availability of services in the three zones of the metropolitan region. While the disparity exists in all the services when analysed on the basis of settlement and area, it is more pronounced in the case of higher level services.

J-1 : 64

(R. K. Mandal)

K. Z. AMANI, Dimensions of Urban Poverty and Public Policy, *The Geographer*, Vol. XXX. No. 2, 1983, PP. 49-51.

In India a major segment of population suffers from under-nutrition, stays in habitations which are unfit for living and does not have the means to obtain clothes for protecting itself from the vagaries of Nature. Poverty, however, manifests itself in towns especially in metropolitan cities where it offers a glaring contrast in the midst of affluence.

The nature of urban poverty is different from rural poverty. But they are tied together as urban poor of the country are only an overflow of the rural poor to the cities. As a result of this migration the slum population has increased considerably, being a quarter of the total urban population in most of the cities.

The dimensions of urban poverty can be gauged by assessing the pattern of employment and income of people living in the slums and squatter settlements and also by taking note of the basic amenities available to them in their place of living.

With the rapid expansion of industrial and other activities more and more people are bound to be attracted towards cities and thus increase the number of the urban poor. It will further increase the problems faced by the slum dwellers and the city planners. In order to cope with the situation the author has identified three important issues for consideration by city planners:

i) improvement in the environmental situation of the present housing in the metropolitan cities; ii) renewal of present housing stock, i.e. immediate replacement of slums and rehabilitation of slum dwellers; and iii) assessment of the effective housing demand and housing requirements at minimum standard.

(M. Farooq Siddiqi)

J-7 : 65

M. I. HUSSAIN AND N. A. SIDDIQI, Urban Expansion and Enchroachment : A Case Study of Khurja (1950-73) *The Geographer*, Vol. XXX, No. 1, 1983, PP. 82-93, 7 Tables, 3 Maps.

The urban encroachment on agricultural lands, though not yet alarming in India, is gradually increasing in magnitude. The post-independence period has witnessed accelerated rate of encroachment around industrial centres like Ghaziabad, Modinagar, Meerut and Khurja. The authors have tried to trace urban encroachment on agricultural lands in Khurja during the period 1950-73.

Municipal limits of Khurja town in 1950 extended over 277 hectares but by 1973 it encroached upon 951 hectares of arable land making the total area of the town as 1,228 hectares. The authors have studied this growth in four phases, each of six years duration. In the first phase actual encroachment was on 21 hectares of land (2.2 per cent of the total area encroached upon) of which 20 hectares were on good quality agricultural land. During the second phase as much as 39 hectares (or 4.2 per cent of the total) were added and the encroachment again was totally on good quality agricultural land. The extent of encroachment considerably increased in the third phase during 1962-67 when 217 hectares or 22.8 per cent of the total were encroached upon. Of the total area involved in urban encroachment about 73 per cent was good quality land, 15 per cent medium quality land and 12 per cent poor quality land. Fourth phase during 1968-73 witnessed enormous encroachment on 674 hectares (70.8 per cent of total encroached area) of land. About 77 per cent of this land was of good quality while 23 per cent was of medium quality.

(M. Farooq Siddiqi)

J-7 : 66

S. BANERJES AND A. CHAKRABARTY, Spatial pattern of Socio-Economic Characteristics in Calcutta Metropolitan District, *The National Geographical Journal of India*. Vol. XXIX, Nos. 1-2, 1983, PP; 63-9, 14 Maps.

The present paper analyses the nature of the spatial pattern of socio-economic characteristics in the surrounding areas of Calcutta during 1961 when Calcutta Metropolitan district was delimited. The study intends to throw light on the role of Hoogly river, the routeways, the Hoogly industrial belt and the city of Calcutta on the spontaneous spread of urban characteristics before Calcutta metropolitan planning was instituted.

The study also points out that the nature of urban development in Calcutta Metropolitan area at an early stage was predominantly spontaneous, unorganised and unplanned. This study of the socio-economic structure of the Calcutta Metropolitan District during the early period of planning will be in order for throwing light on the structural gaps which existed in the spontaneous urban spread as well as for estimating the future achievements in planning. The present study analyses the patterns as in 1961.

Data for the present analysis has been collected for the smallest unit of planning in Calcutta Metropolitan District Authority

which is numbering 200. Calcutta city has been excluded from the analysis. To identify the spatial patterns of socio-economic characteristics, 11 indicators were chosen. Distribution of each indicator has been mapped.

(Salahuddin Qureshi)

J-8 : 67

S. B. SINGH AND B. N. SINGH, Spatio-Temporal Synchronization of Periodic Markets in a part of India, *The National Geographical Journal of India*. Vol. XXIX Nos. 3-4, 1983, PP. 232-240. 1 Graph, 2 Tables, 3 Maps.

Periodic markets play an important role in the economic and social life of the people in the peasant society of the developing countries. These markets help to accelerate the pace of rural development where agricultural produce and manufactured items are of great commercial significance and flow in a significant volume through the periodic market system.

In the present paper, an attempt has been made to analyse the spatio-temporal synchronization of periodic markets along with their heirarchical classifications and complementary regions by taking Sultanpur district as a case study. Sultanpur district with overwhelming agricultural economy is densely populated and served with a good network of transport facilities. The area consists of four tahsils and fourteen community development blocks and forms a part of the Middle Ganga Valley. On the basis of their periodicity three types of markets have been identified in the area which gives a total member of 21 centres. 25 of these are daily markets, 55 are bi-weekly markets and 11 are weekly markets. These weekly centres are linked with each other both horizontally and vertically. On the basis of commercial population the centrality index for each centre has been computed and grouped into hierarchies. The first order centre is obviously sultanpur in the area. The study finds that there is a wide gap between first and fourth order periodic market centres both in terms of population and area served. The hypothesis that spatial proximity is inversely related to temporal proximity is partially confirmed by this study.

(Salahuddin Qureshi)

J-8 : 68

C. P. PRAKASAM AND M. V. SAGAR, The Sphere of Urban Influence and Metropolitan Dominance in Maharashtra, *Deccan Geographer*, Vol. XXI, No. 3, 1983, PP. 403-9.

The objective of this paper is to examine and analyse the sphere of urban influence and metropolitan dominance in Maharashtra. It appears that in Maharashtra, although metropolitan domination in many socio-economic activities persisted, the one-time small nodal points in the periphery begin to swell with time. These smaller units developed into important urban centres having their own sphere of influence.

The authors cite examples of Bombay, Poona and Nagpur. These metropolises seem to have adverse influence on nearby smaller urban centres like Aurangabad. Hence, in due course of time these nodal points became metropolitan centres and could obstruct influences and discard dominance. The author is convinced that the urban influence of Bombay, Poona, and Nagpur on towns like Aurangabad will gradually diminish, from 1987-2001 A. D. Therefore, by 2001 A.D. Aurangabad can frustrate the influences of Bombay and other cities, itself becoming dominant over other centres. The paper highlights the view that the sphere of urban influence and metropolitan dominance is time-bound, describing this incident as a process in the life of every urban centre.

(Sudhir Malakar)

L. REGIONALISATION, REGIONAL DEVELOPMENT AND PLANNING

: 69

A. P. DESAI, Place Prosperity Versus People Prosperity : A Vital Issue in Regional Planning. *The Indian Geographical Journal*, Vol. LVIII, No. 1, 1983, PP. 64-68.

According to the author the task of geographers is to classify the range of interactions that exist between physical environment and human activity in a series of meaningful spatial systems of regions, so that the structure and the evolution of human locations and their inter-actions can be understood. It will be possible to monitor the processes of production and distribution through regional planning of resource-management to bring about a system of social well-being that the society may like to develop. But such resources in an area are not distributed evenly. This leads to regional disparity and a system of hierarchy which develops is dependent on the availability and use of resources.

Therefore, the present paper focuses on the complex issue of regional development. The removal of spatial inequality in terms of amenities and infrastructural facility may be the first-step in

regional planning leading to place-prosperity' but it may not lead to 'people-prosperity'. It may be observed that the programmes focussed at 'Place-Prosperity' may not necessarily reach all the people due to the problem of leakage in the distribution of benefits in a region. The paper further analyses the minimization of socio-economic gap between people within a region in a vertical fashion rather than the distribution of amenities between regions in a horizontal manner. The author suggests that planning will be relevant and meaningful if it is one far the people at large, keeping in mind their needs and priority.

(Farasat Ali Siddiqui)

L-2 : 70

K. K. DIKSHIT AND A. S. JOB, Rural Settlements in Western Maharashtra : A Study in the Size and Spacing of Villages. *National Geographer*, Vol. XVIII, No. 2, 1983, PP. 177-192, 9 Graphs, 3 Diagrams, 3 Tables, 8 Maps.

This paper examines the characteristics of rural settlements in western Maharashtra. The density of villages and their size variations have been discussed in relation to population density. The spacing of villages has been analysed with the help of Near-Neighbour Analysis. The territorial limits of villages have been studied mathematically and the spatial distribution of villages has been analysed.

It has been concluded that the expansion of the village limits is dependent both on physical and socio-economic factors.

(Bhim Sen Malhotra)

L-3 : 71

V. B. TRIPATHI AND R. CHAND, Micro-level Locational Planning for Market Facilities : A case study of Bulandshahr District, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 63-75, 5 Tables, 1 Graph, 3 Maps.

The paper is an attempt to ascertain optimal spatial organisation of socio-economic facilities in the light of conditions

regional planning leading to place-prosperity' but it may not lead to 'people-prosperity'. It may be observed that the programmes focussed at 'Place-Prosperity' may not necessarily reach all the people due to the problem of leakage in the distribution of benefits in a region. The paper further analyses the minimization of socio-economic gap between people within a region in a vertical fashion rather than the distribution of amenities between regions in a horizontal manner. The author suggests that planning will be relevant and meaningful if it is one far the people at large, keeping in mind their needs and priority.

(Farasat Ali Siddiqui)

L-2 : 70

K. K. DIKSHIT AND A. S. JOB, Rural Settlements in Western Maharashtra : A Study in the Size and Spacing of Villages. *National Geographer*, Vol. XVIII, No. 2, 1983, PP. 177-192, 9 Graphs, 3 Diagrams, 3 Tables, 8 Maps.

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(Bhim Sen Malhotra)

L-3 : 71

V. B. TRIPATHI AND R. CHAND, Micro-level Locational Planning for Market Facilities : A case study of Bulandshahr District, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 63-75, 5 Tables, 1 Graph, 3 Maps.

The paper is an attempt to ascertain optimal spatial organisation of socio-economic facilities in the light of conditions existing in district Bulandshahr of the Upper Ganga-Yamuna interfluvium.

Three types of markets are recognised in the area, viz. weekly markets, fair markets and regulated markets. The pattern of spatial distribution and spatio-temporal characteristics of 70 weekly markets, 36 fair markets and 21 regulated markets are described in detail. It has also been attempted to determine the levels of development of market facilities in different block level areal units. It is observed that almost all the blocks stretching along the river Ganga experience a high level of development. The blocks in which major towns of the district are present have shown low level of development of market facilities as the towns themselves serve as market place and command a wide catchment area.

The authors have tried to formulate diagnostic planning in two systematic phases : an indicative planning suggesting the method of selection of a block for locating the new market centres and the other locational planning dealing with the identification of those settlements in which the proposed facility has to be located in the given block. Following the approach of locational planning 10 weekly markets, 4 fair markets and 2 regulated markets are determined to be proposed market locations in the district in order to attain diagnostically an optimal spatial organisation of market facilities.

(M. Farooq Siddiqi)

M METHODS

: 72

A. L. SINGH, New Methods of Determining Crop Combinations, *The Geographer*, Vol. XXX, No. 2, 1983, PP. 52-62, 4 Tables, 4 Maps.

The concept of crop combinations has engaged the attention of geographers and land-use planners and various methods have been devised for this purpose. Weaver's method has long been used as such or with modifications.

The theoretical standard employed by Weaver appears in the opinion of the writer to be illogical and unrealistic and therefore two new sets of theoretical standards have been proposed in this paper. The rank indices are assigned to various crops in reverse order and the percentages of the index of each crop are calculated

from the sum of indices of all crops. The percentage so acquired by a crop is treated as theoretical standard for that crop in determining crop combination. In the other method, namely reciprocals of ranks, each crop is assigned a rank for which reciprocals of rank are found and then multiplied by least common multiple of the denominators occurring in the reciprocals. The indices are summed up and the percentage of each crop is taken as the theoretical standard for obtaining crop combination.

The writer has applied Weaver's method and her own two methods in delineating crop combinations in Aligarh district in order to assess their relative advantages. The analysis of the results reveals that the multiplicity of the crop combinations in general is higher in the case of Weaver's method and Method II of Reciprocals of Ranks than in Method I of Reverse Ranks.

(M. Farooq Siddiqi)

M-1 : 73

C. BHAN, Bivariate Analysis of Yamuna Ravines-An Illustration of Formulating Mathematical Models in Fluvial Morphology. *Deccan Geographer*, Vol. XXI, No. 1, 1983, PP. 301-19, 2 graphs, 5 Tables, 1 Maps.

In this paper an attempt has been made to study the fluvial geomorphology of the Yamuna ravines by applying the bivariate analysis. The study area comprises the tract of Yamuna ravines which are drained by a large number of streams. By applying Strahler's stream ordering method, the author recognises 320 first-order streams, 73 second-order, 17 third-order, 4 fourth-order, and 1 fifth-order stream. The study of these streams shows that the erosional landscape of the region is highly systematic and follows a given pattern as is usual with all fluvial systems. It appears that as the erosional cycle progressed each element of drainage developed a constant ratio with time. Findings from Agra region, for example, indicate that the model developed for Karmari basin can be used for the entire Yamuna ravines. Besides, the paper states that fairly reliable results can be obtained so long as the climatic and geologic environments remain unchanged. The applied value of such quantitative expressions is enhanced all the more and establish that morphometry is deeply related to important hydrological processes. It is in this context that the paper suggested that the division of the entire country into climatically and geologically well-defined regions and that their drainage be assigned a sequence of orders/numbers. Hence, for each of them statistically devised model based on sample basins could be developed, so that in our planning

programmes these regional models can be used to furnish desired information readily.

(Sudhir Malakar)

M-1 : 74

D.PRATAP AND M.D.SHEDBA, Landuse and Forest cover Type in Dehra Tehsil and Adjacent Siwaliks: An Application of Remote Sensing Methods, *Annals, NAGI*, Vol. III, No. 2, 1983 PP. 15-23, 5 Tables, 5 Maps.

This paper attempts to map various land use and forest types with the help of remote sensing methods. In earlier times information about forest types used to be obtained from field observations. This method was not only time-consuming and expensive but in certain inaccessible areas very difficult also. The remote sensing techniques are capable of furnishing much more information in a shorter time and at a lower cost. The approach adopted in the paper consists of making maps, using the latest remote sensing methods supplemented by reconnaissance visits to the area before undertaking the interpretation of the aerial photographs and satellite imageries and ground verification of the interpretation. To maintain the temporal uniformity of the data, the landsat data pertaining to 1975 have been used as the latest aerial photographs available were for 1975.

(K.Z. Amani)

M-1 : 75

K.S. PAWAR AND D.N. PATIL, Lineament : Their Mapping and Analysis, *Annals, NAGI*, Vol. II, No. 2, 1983, PP 1-13, 6 Maps.

This paper deals with the methodology of lineament mapping and gives examples of its application to problems in earth sciences. Lineaments are a feature of land surface that reflect the sub-surface structure. The mapping of lineament has assumed considerable significance during the recent years. The lineament maps can be constructed from satellite imageries, aerial photographs and topographical sheets. These maps have proved to be of considerable value in the explanation of mineral deposits.

The lineaments in most cases indicate the zones of structural weakness and, therefore, are helpful in the investigation of groundwater. Similarly investigations have shown that data on lineaments is of considerable value in evaluating the nature of the

tectonic forces responsible for determining the dimensions of sub-surface structures.

It is suggested that taking into consideration the significance of lineaments to the investigations of economic geology, groundwater geology, structural geology and tectonics including seismology, its study should be an integral part of earth sciences.

(K.Z.Amani)

P. NATURE OF GEOGRAPHY

P : 76

AIJAZUDDIN AHMAD, Nature of Dichotomy in Geography : General and Particular, *The Indian Geographical Journal*. Vol. LVIII, No. 2, 1983, PP. 97-106.

This paper reviews the subject matter of geography and its peculiarities with a view to investigate into the nature of dualism and to search for causes which seem to have largely inhibited the emergence of general concepts of universal applicability at the same scale as in other sciences. It refers to the historical background within which geography consolidated its methodological framework and imbibed certain traits so peculiar to it. The dualism is studied under two entities of particular and general. The latter one may be drawn after the former studies and thus help the development of logical knowledge. The author has explained briefly and systematically the philosophy of geography. He points out that the period upto the middle of the present century has been characterized by an overwhelming development of the knowledge of the specifics with very little concern for integrative overviews.

The author has analysed the concept of geography through history and has highlighted the difficulties which are faced by the students of geography in India where the case studies have thwarted the development of generic knowledge.

(Farasat Ali Siddiqui)

Q. GEOMORPHOLOGY

Q : 77

C. P. S. RAWAT, I. C. PANDE AND S.S. NEGI, Drainage Basin Morphometric Study of a Part of the Alakhanda Basin,

District Chamoli, *The National Geographical Journal of India*, Vol. XXIX, Nos. 3-4, 1983, PP. 207-16, 6 Tables, 2 Maps.

In the present study various morphometric parameters of the drainage basin have been worked out. Alakhnanda basin covers an area of 340 sq. kms. in the district of Chamoli. It is noted that the lithology and structure have greatly influenced the different morphometric parameters. The resultant drainage pattern of the area is dendritic. The physiography of the area comprises high mountain ridges with individual peaks rising to 3,400 metres and deep valleys to about 900 metres, drained by Alakhnanda and its tributaries. It consists of quartzite, limestone, slate, phyllites, metabasic and magmatite rocks.

To evaluate the effects of bed rock on different morphometric parameters, the area has been divided into three distinct lithological units, viz., gneisses, quartzites and limestones. Drainage basins lying in more than one lithological unit has been avoided. The method for calculating stream orders proposed by Horton and modified by Strahler has been adopted. The drainage network, basin geometry and measurement of dissection and height have been recorded. Rock types and structures such as thrust faults and joints have a profound influence on the drainage of the area. It is noted that quartzites are characterised by low drainage density and stream frequency. Limestone shows high basin circularities and low stream length and in gneiss almost all the variables show a lower value.

(Salahuddin Qureshi)

Q : 78

K. R. REDDY AND N. B. REDDY, Terrain Analysis of the Swarnamukhi Basin, *The National Geographical Journal of India*, Vol. XXIX, Nos. 3 & 4, 1983, PP. 176-187, 2 Graphs, 3 Tables, 4 Maps.

The present study is aimed at realizing the significance of the minor river basins as the fundamental geographical units of study and the basic units of planning and development. The Swarnamukhi river 159 kilometres long, with 3,400 sq. kms. of catchment basin is small but significant river in the semi-arid Rayalseema of Andhra Pradesh. The geological structure of the basin essentially comprises pre-Cambrian formations. The Swarnamukhi basin presents itself into two distinctly marked topographic divisions viz., the hilly upper, western part of the edge of Mysore plateau and the lower, eastern part of the plain in the coastal realm. The Tirumala hills

entering the upper part of the basin form the main range of the eastern Ghats in this region. The eastern extension of these ranges is broken by a long north-south trending valley. The piedmont regions are barren and present a badland topography with deep ravines. The maximum height of the basin above mean sea level is 1,150 metres. However, nearly half of the basin lies below 76 metres. An expression of the slope and relief aspects of the basin is complicated due to the fact that it is difficult to express a three-dimensional variation by a simple index.

(Salahuddin Qureshi)

Q : 79

SURENDRA SINGH, Application of Remote Sensing Techniques in Geomorphological investigations-A Case Study of Jodhpur District, Western Rajasthan. *Annals of Arid Zone*, Vol. XII, No. 4, 1983., PP. 283-294.

The geomorphological problems are being studied with the help of remote sensing technique. The present paper deals with this technique taking the case study of Jodhpur district of Rajasthan.

With the help of an interpretation of the aerial photographs and landsat imageries the author has made an attempt to identify ten major geomorphic units in Jodhpur district. Landsat imageries have been found suitable for identification and delineation of the boundaries of hills, pediments and dunes. But the younger and older alluvial plains are there distinctly visible on landsat M. S. S. Bands image which enable to delineate and map the boundaries of these geomorphic units. These geomorphic units which have different physical potentials and limitations will provide a sound basis for the rational use of land, soil and water resources of Jodhpur district.

(Bhim Sen Malhotra)

Q : 80

A.G. JAMKAR AND S. M. BHAMRE, "Morphometric Analysis of River Panzara and Her Important Tributaries - A Case Study", *Transactions, Institute of Indian Geographers*, Vol. V, No. 2, July, 1983, PP. 183-88, 3 Tables, 2 Diagrams.

River Panzara is a tributary of river Tap in Dhule district of Maharashtra. The study tries to visualise that in the homogenous lithological axes, the main river may differ in geomorphic

character and stages of landform development from its tributaries. The Panzara basin lies towards the northern part of the plateau. Geologically, the area is basaltic of the Eocene period but over it there is a thin layer of recent period.

An attempt has been made here to compare between river Panzara and her other major tributaries. Thus 10 tributaries have been randomly selected - 5 each from the right and the left banks.

Three geological formations, viz., Bagh Beds (upper Cretaceous) not exposed in the basin, 2) Deccan Basalt (Eocene) exposed in the basin with some dykes, 3) Alluvium deposits (Recent period) have been identified.

The parameters taken into account, for the study, are stream order, numbers, bifurcation ratio, average length, average length ratio, drainage density, drainage frequency, relief and slope.

With the help of one inch topographical sheets and field checks a morphometric investigation has been carried out of these 10 sub-basins.

An attempt has also been made to correlate the stages of landform development and morphometric parameters between the main river (Panzara) and her tributaries by using statistical techniques. Percentage mass removed and geomorphic characters of each drainage basin have been statistically computed. Correlation coefficient, coefficient of determination (R^2) and of regression have been worked out to examine the stages of landform development.

The results show high variations in geomorphic characteristics in case of parameters, like total number of streams (115.49), slope in degrees (99.08), total stream length (93.58), area (81.12) and relief (57.89), while the remaining parameters indicate very little variation.

The hypsometric curves, drawn for all the selected 10 tributaries, and also for the entire basin, indicate the stages of landform development. After working out percentage mass removed, it has been found that none of the tributaries nor the main river is in youthful stage. River Panzara is in late mature stage while the 5 tributaries in old stage and 15 in mature stage.

(Nasim Aijaz)

.Q : 81

H. S. SHARMA, Inland Drainage of North-eastern Rajasthan and its Possible Link with the Ghaggar-Yamuna System, T. I. I. G. Vol. V, No. 1, 1983, PP. 19-22, 1 Maps.

The author tests the hypothesis that inland drainage basins of the north-eastern Rajasthan, namely the Katli, Sabi, Dohan, Barah and Barganga, had possible links with the Ghaggar-Yamuna System and later due to rise of the Divide and with the onset of aridity these streams were left as beheaded streams.

The study is essentially based on visual interpretation of the landsat imagery pertaining to the period of 1972-77 in a variety of forms and format at the Space Application Centre (ISRO), Ahmedabad, supplemented by field work.

According to the author, the palaeo-Yamuna had probably changed her course three times along the 3 palaeo channels identified. They are shown on a map. In the first instance it joined the ancient river Ghaggar. Later it might have flowed into Ghautang (Drishadwati). In the third stage it might have flowed through the present course of Yamuna down to Delhi and then connected the small lake near Bharatpur (Ghana) and finally joined probably the Chambal. In between the second and third stages the Yamuna might have had a course along a curved line from Jhajar in the north to Bharatpur in the south connecting Nuh and Pahari.

The inland rivers have probably been connected with the Yamuna in her former courses. The author cites the evidence of fluvial sand in Rajgarh and Sidmukha as an evidence of the possible link of the Katli with the Drishadwati. The Dohan and the Sabi might have been flowing into the Yamuna during the interval between the second and third stages. The Barah which now ends near Parhi may further be traced upto south of Hodal. The numerous ox-bow lakes and palaeo channels and the braided nature of the Banganga in her lower course suggest its possible link with either the Chambal or Yamuna.

(K. S. Sivasami)

Q : 82

K. R. DIKSHIT AND S. N. KARLEKAR, Formation, Thickness and composition of Konkan Laterites, The National Geographical Journal of India. Vol. XXIX, Nos. 3 - 4, 1983, PP. 164-175, 4 Graphs, 2 Tables, 4 Maps.

The paper discusses the laterites of south Konkan and compares the thickness, p^H , iron content and the electrical conductance of different horizons in the laterite profile, as seen in the older and massive crest and plateau laterites and the younger laterites near the coast. It is found that the iron content in the older laterites of the west zone of Sahyadris and Konkan plateau is not only higher than in the coastal laterite but the level of concentration from surface downward follows an opposite sequence in the two laterites. The study identifies decreasing concentration of iron from surface downward in the plateau laterites while in case of coastal laterites the percentage of iron increases with depth, as these laterites are younger and secondary in origin. In the southern part of the study area the laterites seem to have been largely eroded and occur in the form of residual cappings. Though it is not possible to infer the maximum thickness of the laterites that might have been in the southern part of the study area, however, there are indications that it was thin and patchy and could not protect the landscape from being stripped as it has done in the northern part of the Ratnagiri and Devgarh.

The study further reveals that the older plateau laterites show higher acidity all through the profile as compared to the younger coastal laterites in which lithomarge tends to attain a p^H close to 7. The formation of laterites in view of their iron concentration and p^H value in the profile and certain assumed topographic conditions is discussed in the paper.

(Salahuddin Qureshi)

Q : 83

PRAMILA KUMAR AND LAKHESHWAR PRASAD BAGHEL, "The Ken and its Gorge : Some Explanations", *Transactions of the Institute of Indian Geographers*, Vol. V, No. 2, July, 1983, pp. 95-100, 3 Maps, 1 Diagram.

In this paper an attempt has been made to offer an explanation for the unusual nature of the gorge of the Ken river. It analyses the geomorphic processes which might have helped in the formation of the gorge and the peculiar nature of the drainage of the Panna-Bijawar range.

The Ken is a tributary of the Yamuna. It rises from the Bhandar plateau and drains the Sagar-Damoh plateau. It has been observed that while crossing the Panna range the river appears to be discordant with the surrounding topography. From the northern

scrap of the Bijawar - Panna range, the land gently slopes towards the centre of the plateau. What is curious is the fact that the river flows against this slope and crosses the range through a gorge, 60 km. long and 500 - 600 ft. (152 - 183 metres) deep.

The authors investigated this question and after analysing in detail the evidence collected from the field, landsat imageries and detailed maps developed the hypothesis that it is a case of river capture. The authors have postulated that the Ken captured the drainage of the Sagar-Damoh plateau. To be more precise the Ken has captured the upper reaches of Tons river which has been beheaded and now only drains the Rewa plateau. Due to this factor the increased water supply has accelerated the erosive power of the ken and enabled it to flow across the gorge. Another finding which has supported their view is the evidence of the rejuvenation of the gorge. The authors have found that this area was subjected to an upliftment in the recent geological past. Several erosion surfaces which have also been identified by other research workers undoubtedly offer the evidence of such a rejuvenation.

(Nasim Aijaz)

Q : 84

SAVINDER SINGH and R.S. PANDEY, *Morphometric Processes, Landforms and Environmental Planning in Bhandar Plateau Region, India, National Geographer, Vol. XVIII, No. 1, 1983, pp. 29-54.*

The authors have made an attempt to analyse the role of environmental factors such as terrain, natural vegetation, precipitation, drainage and erosion in the environmental planning of Bhandar Plateau which covers Panna and Satna districts of Madhya Pradesh. It is a well defined physical region with definite physical boundaries. Sandstone, shale and limestone are the main rocks exposed in the region. Laterites and alluvium are also found at places. Morphology of the plateau gives evidence of a very long process of denudation starting from Pre-Cambrian period and continuing to the present. The region experiences the monsoon climate and the fluvial processes are obviously very active. However, wind erosion is also important during certain parts of the year. Mechanical collapse due to under-cutting of rocks and sun cracks over alluvial deposits are important characteristic features of the region. The physiographic characteristics show that the region is in mature stage of development. On the other hand, presence of water-falls and long and narrow gorges suggest some obstruction in the theoretical progress of Davisian Cycle of erosion. Escarpments with steep slopes form an important feature on the north-western and eastern margins of the region.

With the help of photographs and sketches the authors have highlighted a number of problems being faced in the region. They include scarcity of water supply, deforestation, overgrazing, soil erosion and the relative inaccessibility. They have concluded that proper environmental planning is possible only if physical factors are taken into consideration. The aim of planning should be to help environment and the tribal people living in the region.

(Harjit Singh)

R : 85

B. PANDEYA AND N. PRASAD, Hydrological Regions of Bihar, T.I.I.G. Vol. V, 1983, PP. 1-10, 6 Graphs, 2 Tables, 9 Maps.

The authors have mapped the climatic types of Bihar State according to the schemes of De Martonne, Land and Koppen. The components of water balance were computed for 16 stations according to the Thornthwaite's method (1955). Normal monthly temperature and rainfall and their yearly values for the period 1951 to 1968 were used for this study. The components of water balance viz., Potential Evapotranspiration, Actual Evapotranspiration, water surplus and water deficit were depicted on maps and tabulated. The variability of annual rainfall, water surplus and water deficit were presented in another table.

The spatial variations of these components are as follows; P.E. : 1310-1555 m.m; Actual Evapotranspiration : 953-1288 mm; Water Surplus: 63-385 mm; and water deficit : 274-684 mm. The variability of annual water surplus is much higher than the annual variability of rainfall and water deficit.

After analysing the spatial and temporal variations of the components of water balance, the authors delimit the hydrological regions of Bihar by taking into account the water surplus and water deficit. The values of water surplus are grouped into 4 categories viz., A 1: Nil A 2: less than 200 mm; A 3: 200-300 m. m. and A 4: more than 300 m.m. Similarly water deficit values are grouped into 3 categories: viz., less than one grouped into three categories; viz., B 1 less than 300 m.m. B2: 300-500 mm. and B3: more than 500 mm. The combinations of these categories make a hydrological region. For example A2B3 means a region in which the annual water surplus is less than 200 mm and the water deficit is more than 500 mm. In this manner 7 hydrological regions are recognized .

(K.S. Sivasami)

R : 86

N. B.K. REDDY AND K.R. REDDY, Surface Water Resources in Swarnamukhi Basin; *National Geographer*, Vol. XVIII, No. 1, 1983, pp. 19-28, 1 Diagram, 1 Table, 3 Maps.

This paper is an attempt to estimate the surface water resources in the Swarnamukhi Basin. The Swarnamukhi river with a total length of 159 km. and a catchment area of 3400 sq. km. has a small basin in the semi-arid Rayalaseema region of Andhra Pradesh. The entire basin may be divided into 6 sub-basins and 20 micro-basins and the region is characterised by high variability of rainfall. The rapidly developing Tirupati urban complex and the growing needs of water in agriculture and industry have put enormous pressure on the water resources of the basin. The authors have used Barlow's tables to calculate the surface run-off. The depth of rainfall in each sub-basin has been determined on the basis of Thiessen's polygon method for 13 rainfall stations. The run-off coefficient has also been calculated. The authors have suggested that 75 per cent of the total run-off may be taken as dependable. The gap between the yield and total utilisation capacity of surface water has been calculated for each sub-basin and micro-basin. The study shows that the three sub-basins *viz.*, Upper Swarnamukhi, middle Swarnamukhi and Rallakalva have surplus water while the remaining three suffer from deficit of water. It has been found that 9 micro basins have surplus water, 3 have sufficient yield just to meet utilization capacity and the remaining micro-basins have a deficit. It has been concluded that in 4 micro basins water deficit cannot be compensated by inter-basin transfers due to topographic constraints.

(Harjit Singh)

R : 87

N. SIVAGNANAM AND KUMARSWAMY, Ground Water Quality in the Vaippar Basin, South India. *The Indian Geographical Journal*, Vol. LVIII, No. 2, 1983, PP. 127-42, 1 Diagram, 3 Tables, 6 Maps.

Grouping of groundwater types and analysing spatial, seasonal and secular variations in the chemical characteristics of the groundwater in relation to the environment of a groundwater basin are realized as the best among multiple choices given to study the groundwater quality. Studies of this kind are limited. Therefore, an attempt is made here to analyse spatio-temporal variations of

groundwater of Vaippar basin in relation to geology and geomorphology. Four major geomorphic zones have been identified in the basin. The groundwater has been classified into six types of cation and anion groups depending upon the dominance of chemical characters based on the samples of 82 controlled wells distributed throughout the basin in 1981.

It may be noted that all the groundwater types are positively related with each other but the very high degree of relationship is recorded between sodium-sulphate, sodium-chloride and calcium-chloride waters. Saline and alkaline hazards are also discussed. Lastly, the relationship between geomorphic zones and the chemical dominance is presented.

(Farasat Ali Siddiqui)

R : 88

V.P. SUBRAHMANYAM, Some Aspects of Hydroclimatolgy and Water-Balance of the Chandrapulam Basin, *T.I.I.G. Vol. V*, No. 1, 1983, PP. 11-8, 6 Graphs, 1- Diagram, 2 - Tables 2 Maps.

Chandrapalam basin lies in the Kamalkonda hills of Eastern Ghats near Visakhapatnam in Andhra Pradesh. This study is entirely based on the measurement of the components of the water balance in the field during the period 1969-72. Rainfall was measured through 6 ordinary rain-gauges of the Symon type and 2 self-recording rainguages of the Casella (Natural Syphon) pattern. Soil evaporimeter was used to obtain the evaporation losses from the basin. Moisture content of soil from representative locations was measured every week by the drying and weighing method. Fluctuations in ground water level were measured by regular free water-table observations in 120 selected upumped open water wells.

Ground water fluctuations were studied using four-month moving average method. This analysis shows that the peaks and troughs in groundwater levels occur about 2 months after the occurrence of maxima and minima in the rainfall. About 17 mm. of rainfall fluctuation from the average produces 1 foot of corresponding variation in the water table depth.

(K.S. Sivasami)

S. CLIMATOLOGY

S : 89

G.B. PANT AND H.P. BORGAONKAR, Growth Rings of Teak Trees and Regional Climatology : An Ecological Study of Thane Region, *Environmental Mangement*, 1983, PP. 153-58, 2 Graphs.

Describing briefly the significance of forest, the authors attempt to study the effect of the local environment on forest growth. They determine the age of trees, study the functional relationship which represents the long-term changes attributable to the hereditary characteristics of the species and the effect of site on the symmetry of growth and age of the tree. They further point out the relationship between the climatological data and ring width measurement and the reconstruction of climatic changes from the ringwidth data using the inverse fuction relations and test its reliablitly.

After an overall assesment of the present study the authors suggest that the site factors modify the tree structure and growth pattern but the rate of growth possesses a function decreasing trend with the age of the tree. The tree growth is significantly related to rainfall and large length of the monsoon season but the heavy monsoon rains with some continuous cloudiness are weakly and negatively related to tree growth. The findings indicate that optimum conditions of climate in terms of rainfall intensity and distribution during the year are favourable for tree growth in the study region.

(Farasat Ali Siddiqui)

T. SOIL GEOGRAPHY

T : 90

B.K. SHARMA,, AND A.S. KOLARKAR, Available Major and Micro Nutrients in Arid Soils of Jamnagar District of Gujarat : *Annals of Arid Zone*: Vol. XXII, No. 1, 1983, PP. 1-5, 2 Tables.

This paper analyses the occurence of major and micro nutrients in the soils of Jamnagar district of Gujarat. With the average annual rainfall of less than 300 m.m. the district experiences an arid climatic regime. The authors collected 27 soil samples for detailed

analysis. The study reveals that the arid soils are poor in organic carbon, fairly well supplied with P₂O₅ and very rich in K₂O. The chemical properties of soils and their mineral constituents have been described in detail.

The authors have concluded that the detailed soil analysis is necessary for determining the fertility status of soils and for their optimal utilization for agricultural production.

(Bhim Sen Malhotra)

U. BIOGEOGRAPHY

U : 91

G. SINGH, Spatial Distribution of Deodar Forests in Chenab Forests Circle, *The Geographer*, Vol. XXX, No. 2, 1983, pp. 76-85, 3 Tables, 2 Maps.

In the state of Jammu and Kashmir 56.56 per cent of Kashmir and 45.51 per cent area of Jammu is covered by forests. There is a number of commercially important species of trees but the most important of them is *Cedrus deodara* (deodar). The author has presented spatial distribution of deodar within Chenab valley where it grows well owing mainly to favourable climatic, edaphic and other geomorphological factors.

In the Chenab Forest Circle deodar occupies a prominent position amongst all the commercial species. Of the total deodar area in the Forest Circle about 36 per cent is contributed by Bhaderwah forest division, 34 per cent by Doda division, 18 per cent by Kishtwar division and 10 and 1 per cent respectively by Ramban and Reasi forest divisions. As far as the tree population is concerned deodar trees account for 49 per cent of the total in Bhaderwah, 32, per cent, in Doda, 14 per cent in Kishtwar whereas only 5 per cent is found in Ramban and Reasi forest divisions.

Overall per hectare density of deodars is highest in Bhaderwah forest division which accommodates 186 trees per hectare of land. This is followed by Doda with 128 trees per hectare. The third place is occupied by Kishtwar with 110 trees per hectare while the fourth and fifth place is occupied by Ramban and Reasi respectively with 67 and 4 trees per hectare.

(M. Farooq Siddiqi)

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POLITICAL GEOGRAPHY

B-6 : 1

M.A.H. SIDDIQI, "Politico-geographic Environment of the Indian Ocean Littoral : A Search for Remedial Aspects", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 62-67. 1 Table

Indian Ocean is likely to be the theatre for testing the strength of the antagonistic Super Powers and therefore the littoral countries have genuine cause to worry about their security and inescapable involvement in the struggle. The way to stop confrontation is to bring the littoral countries closer to each other so that they may act as a barrier between the Super Powers and prevent them from confrontation. It is in this context that the author suggests to apply Jones' Unified Field Theory in the form of political idea-decision-movement field - as a political area chain. The best way to bring countries closer to each other is to establish economic, educational, cultural and diplomatic contacts.

The author has suggested that the extent of friendliness or hostility among the littoral countries of the Indian Ocean may be evaluated by employing Boulding's model for determining "hostility-friendliness index". On applying such a hypothetical model to find the degree of friendliness or hostility between India and some of her coastal neighbours it is found that Malaysia emerges as the most friendly country and Pakistan a hostile one. Similar studies are suggested to find India's relationship with other groups of countries such as those of ASEAN, the Gulf and the OAU.

Such analysis would help in bringing to light areas of weakness in the foreign policies of countries which could be framed in such a way that the areas of conflict are minimised.

(M. Farooq Siddiqi)

SOCIAL GEOGRAPHY AND CULTURAL GEOGRAPHY

C-8 : 2

R.S. DUBE and R.P. MISRA, "Nutritional Availability Patterns in Madhya Pradesh", *Transactions of the Institute of*

Indian Geographers, Vol. VI, No. 2, July, 1984, pp. 79-89. 2 Tables.

The quantitative and qualitative aspects of food nutrients availability have been discussed in this paper. The study is based on food-balance sheet method. In Madhya Pradesh, per caput food nutrient availability was about 1965 calories in 1981, as against the recommended requirement of 2400 calories, suggesting a net deficiency of 18 per cent. Nearly three-fourths of the area of the state is in deficit in respect of nutritional availability. Spatially, the areas north of Narmad-Son axis are in surplus, while those south of it are excessively in deficit. Moreover, the Malwa Plateau, the Madhya Bharat Plateau, and the Bundelkhand region, the Chhatisgarh region, and the Rewa Plateau are the deficient areas in respect of the nutrients availability.

It, therefore, follows that the rice growing eastern districts of the state are deficient in nutrients availability, while the western and northern areas of the state between the surplus north and the deficit south.

The paper is largely exploratory in nature and does not go beyond identification of the spatial patterning of nutrition level among the districts of Madhya Pradesh.

(R. K. Mandal)

C-11 : 3

JAGDISH C. BHATIA, "Density of Population and Social Pathology in India", *Indian Geographical Studies*, No. 20, March, 1983, pp. 6-17, 7 Tables.

This paper is an attempt to find out the relationship between the density of population and certain social phenomena i.e. infant mortality, crime rate, birth rate, literacy rate, health services etc.

It is quite evident from the available statistics that the number of cities with 10,00,000 population or more has gone up, in the recent past while the number of small towns has decreased. Furthermore, the densely populated areas have been able to attract more educated and skilled people causing serious imbalance in terms of social and economic growth. Though not very conclusive, positive relationship between the density of population and infant mortality is discernible from the data. But because the densely

populated states with their larger resources are able to provide better health and medical facilities, they are able to neutralise this effect.

Although the analysis does not reveal any significant relationship between the mental cases treated at the medical centres and the density of population, the author feels that the Indian social situation causes significant mental tensions which do not by themselves become a cause for medical intervention. There is a need to enrich the conditions of mental health through social action and not only medically.

(R. K. Mandal)

ECONOMIC GEOGRAPHY

D-1 : 4

FARASAT ALI SIDDIQUI, "Regional Patterns of Occupational Combinations in Uttar Pradesh", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 53-61, 1 Table, 6 Maps.

The author has worked out critical occupation combinations for the rural and urban population of the districts of Uttar Pradesh and plotted them on a map to get their pattern of regional distribution. The study is based on nine major industrial categories of working population adopted by the Census of India. Occupation combinations have been worked out using Doi's and Rafiullah's methods of least square or minimum deviation and maximum positive deviation respectively.

Cultivation is the only occupation which ranks first for the total working population of all the districts except Mirzapur and Dehra Dun where agricultural labour and services respectively take the first rank. However, in the two districts cultivation occupies the second rank.

The pattern of occupation combination regions thus obtained indicates that the state is characterized by a highly diversified urban economy notably with rural character as majority of the districts come under four and five occupation combinations. Cultivation and agricultural labour are found to be highly dominant for both the total and rural populations of the districts relegating the other occupations to very low position. Almost all the districts of west U.P. have relatively high percentage of population engaged in cultivation, whereas districts in the east have relatively high percentage of agricultural labourers.

(M. Farooq Siddiqi)

D-1: 5

K.A. MOHABBAT, A. DALAL, and M. WILLIAMS, "Import Demand for India : A Translog Cost Function Approach", *Economic Development and Cultural Change*, Vol. XXXII, No. 3, April, 1984, pp. 593-605, 3 Tables

Most developing countries depend heavily on imported resources in the form of raw materials or supplemental capital to increase their per capita income. In this paper the authors proposed to estimate the demand for imports as a factor of production in India for the years 1960-75, using a translog cost function approach. In addition to it, it was investigated whether the composition of output has any significant effect on the demand for imports in India.

For this the authors used a three-input, two-output model. Import (M), Labour (L), and Capital (K) were used to produce consumption goods (Y_c) and investment goods (Y_i) for domestic or foreign use. Durables and structures were included in the investment goods category and non-durables and services in the consumption goods category.

The plan of the paper is as follows : Section II briefly discusses the methodology and data ; Section III deals with the empirical results ; Section IV presents a summary and conclusions.

The study has yielded the results that the demand curves for inputs are downward sloping and are inelastic. The demand for labour is most inelastic, followed by imports and capital services, respectively. Capital services and imports, and capital services and labour, are substitutes ; the degree of substitutibility between the former pair being greater than that between the latter pair.

(H. Rahman)

AGRICULTURAL GEOGRAPHY

E-1 : 6

M.Y. FAROOQI, JAMSHED NASIR and TASNEEM FATIMA, "Distribution of Mineral Nutrients obtained from the Food Crops of Uttar Pradesh", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 86-92. 4 Maps

The authors in the present study have tried to assess the level of mineral nutrients as obtained from the food crops produced in Uttar

Pradesh. Mineral nutrients that have been studied include calcium, iron, phosphorus, sodium, potassium, magnesium, zinc, iodine, flumodine, etc. The actual content of these mineral nutrients was obtained and then their lower or upper levels of availability were worked out in terms of average standard requirement for India as a whole.

The distribution of calcium available from cereals, pulses and sugarcane indicates that all the districts fall below the standard requirement. The authors have not considered dairy products and vegetables, the two major sources of calcium in their calculation but have pointed out that even after allowing for 50 per cent of the present availability obtained from these sources, the aggregate level of availability hardly meets the standard requirement except in a few districts of northern U. P.

The per capita availability of iron supply is not critical in the whole of Uttar Pradesh except in the districts of Agra, Mainpuri and Bahraich. Most of the districts of eastern Uttar Pradesh have sufficient supply of iron and are therefore far from any iron deficiency danger.

As far as the availability of phosphorus and other nutrients is concerned the situation is not critical in Uttar Pradesh. It is however interesting to note that the regions producing high amount of phosphorus-contained foodgrains also produce high amount of other mineral nutrients. Similarly the low production of other minerals is concentrated in those districts which produce low amount of phosphorus-contained foodgrains.

(M. Farooq Siddiqi)

E-2 : 7

V. S. DATYE and S. C. GUPTE, " Association Between Agricultural Land Use and Physico-socio-Economic Phenomena : A Multivariate Analysis", *Transactions of the Institute of Indian Geographers*, Vol. VI, No. 2, July, 1984, pp. 61-72, 3 Tables, 3 Maps.

An attempt has been made in this paper to quantitatively measure the influence of some selected physico-socio-economic phenomena on patterns of agricultural land-use. With the help of ICL 1904 S Computer Unit (Package ICL 1900 Statistical Analysis XD S 3/26) the effect of fourteen variables on the landuse types of Poona

district has been attempted using the simple correlation, multiple regression and Principal Component analysis. The results of the correlation and multiple regression analysis bring out the importance of physical environment viz., distance from crest, slope $> 3^\circ$ and $< 20^\circ$ on determining the landuse pattern. The influence of socio-economic factors is not that significant except in the case of cash crops. The principal component analysis helps to define seven dimensions of agricultural landuse. The factor loading and eigen values of the components for each of the fourteen variables and mapping of component scores for one hundred thirty-five physical regions help understand the characteristics of spatial variation in the landuse of the sample area. In fact, the mapping of components have very clearly brought out the validity of the regional frame developed on the basis of physiographic variations.

(R. K. Mandal)

E-2 : 8

H. G. PATHAK, " An Approach Towards Measuring Land use Efficiency in U. P. Himalaya", *The National Geographical Journal of India*, Vol. XXX, No. 3, Sept. , 1984, pp. 181-90. 1 Tables, 5 Maps.

There are various methods through which landuse efficiency can be determined. Among these commonly used and widely accepted criteria is output per unit area. In this method areal units are ranked according to yield/ha and subsequently ranking coefficients are obtained. This method of ranking the areal unit has, however, one major drawback due to neglecting the proportionate share of land under different crops within an areal unit for which yields are taken. The region of U. P. Himalaya comprises eight districts, namely, Almora, Naini Tal, Pithoragarh, Garhwal, Chamoli, Tehri, Uttar Kashi and Dehra Dun. It is divided into 76 blocks. For the purpose of measuring landuse efficiency block-wise unpublished data for crops (1972) were collected from the district headquarters of each district and nine prominent crops were selected.

The pressure of population on agricultural land is very high. The average persons per hectare cultivated land are 54 as compared to 2 for the state average. Mostly double and triple cropping is practised. The crop intensity index is 158.8 as compared to the state figure of 130 and the national average of 116.7.

The study of per hectare production of crops in the region reveals that there are great regional variation due to the effect of

terrain, micro-climatic, soils and farm conditions. On the basis of this study efficiency indices have been calculated for crops in each of the 76 blocks. Bhatia's equation has been used for determining efficiency. Six main classess of varying efficiencies were distinguished.

(Salahuddin Qureshi)

E-2 : 9

S. CHATTOPADHYA and K. BAGCHI, "Changing Character of Agricultural Landuse in the Littoral Tract of Deltaic West Bengal", *The National Geographical Journal of India*, Vol. XXX, No. 3, Sept., 1984, pp. 153-64. 4 Tables, 3 Maps, 2 Diagrams

The littoral tract of deltaic West Bengal is different in view of environment as well as socio-economic characteristics. The whole area has been reclaimed from the low lying tidal marshes with mangrove vegetation by throwing embankments encircling the islands which are well below the high tide level. Agricultural intensity has increased over the years in the whole region. In north-western plain crop intensity had decreased from 1944-45 to 1954-55 but again it has increased considerably. Some areas have recorded crop intensity of more than 115%. Crop intensity in Mandir Bazar and Hasanabad is even more than 120 per cent. Relationship between crop intensity and population density has been calculated for 1944-45, 1954-55 and 1975-76.

It is observed that pulses which covered nearly 50% in 1944-45 are now covering only 33.89% and are surpassed by vegetables 34.17%. A steady increase is marked in the cultivation of chilly. Acreage under oilseeds has considerably decreased. Sweet potato, wheat and water melon are the three new crops introduced in seventies. Agricultural landuse is gradually changing. Introduction of HYV paddy and other vegetable crops to cater to the needs of growing population within the region and also to the markets outside clearly indicates the farmer's response to the market demand. This changing pattern also points to the enormous possibility for the development of the region.

(Salahuddin Qureshi)

E-2 : 10

QAZI MOHAMMAD AHMAD and MOHAMMAD FIROZ KHAN, "Changes in the Cropping Pattern of the Punjab Plains

(1966-67 - 1976-77)", *The Geographer*, Vol. XXXI, No. 1, Januray, 1984, pp. 14-31. 3 Tables, 4 Maps.

The paper analyses decadal variations in the cropping pattern of the Punjab plains during 1966-67 and 1976-77. The changes pertain to wet food crops (rice, wheat and maize), rainfed crops (jowar, bajra and barley), pulses (gram, tur, masur, moth and others) and cash crops (cotton and sugarcane). The formula proposed by Rafiullah has been applied to obtain crop associations indicative of typology of cropping. Changes in the level of crop specialisation were determined on the basis of Gini's coefficient of concentration.

The decadal changes in the area of different groups of crops indicate a major shift away from the normal pattern. Wet food crops have been found to have spread into the rainfall deficit area.

Pulses are marked by a decline but in some areas there is marginal increase also, presenting a mixed trend. Although they show increase at regional level, an appreciable number of districts have also recorded a decline. Rainfed crops have however shown a decline in the whole of Punjab plain.

The cropping typology during the decade indicates an upward trend in specialisation and monoculture. The spatial pattern of change in the crop specialisation generally corresponds with the pattern of availability of water. The areas relatively well palced in terms of water supply show a strong trend towards specialisation while those deficit in water are characterised by diversification of cropping.

(M. Farooq Siddiqi)

E-3 : 11

SHAMSUL H. SIDDIQUI, H. RAHMAN and M.F. SIDDIQI, *Regional Analysis of Agricultural Productivity in Bihar*", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 77-85, 2 Tables, 2 Maps.

Bihar with 66 per cent of her total working population engaged in agriculture is an agriculturally important State. Fifteen important crops are grown here which for the purpose of present study of agricultural productivity have been grouped into four categories, namely cereals accounting for about 75 per cent of the cropped area, pulses with 13 per cent, oilseeds with 2 per cent, and cash crops with 2.5 per cent of the total cropped area. The authors

have calculated crop productivity indices for all the four groups of crops in all the districts of the State. The crop productivity indices have been worked out on the basis of Yang's formula. The indices are then used to group the districts into high, medium and low categories in respect to cereals, pulses, oilseeds and cash crops. Besides presenting a detailed description of the distribution of productivity regions with respect to different crop groups, the authors have also presented an overall picture of agricultural productivity in the state by calculating a composite index and by depicting the results on maps.

The presence of large area - about 85 per cent of the total area of the State - under medium and low productivity may be attributed to losses by floods or drought together with a high growth rate of population. Agriculture in Bihar also suffers from unscientific methods of cultivation, small size of holdings, inadequate supply of manures and improved seeds and lack of assured irrigation.

The productivity of land is high in areas of fertile soils associated with an assured supply of water, while in areas with insufficient water supply and with a thin layer of marginal soils the productivity is low.

(M. Farooq Siddiqi)

E-3 : 12

G.V.S. RAMAKRISHNA and M.D. YADAV, "Variation in Crop Production Efficiency in Indian Arid Districts", *The National Geographical Journal of India*, Vol. XXX, No. 3, Sept., 1984, pp. 173-80, 3 Tables, 4 Maps.

In the present investigation an attempt has been made to measure production efficiencies for cereals, pulses, oilseeds and cash crops in the arid districts of India. Arid area in India is distributed over 30 districts in Andhra Pradesh, Gujarat, Haryana, Punjab, Karanataka and Rajasthan. The study is predominantly based upon data of crop productivity for three consecutive years beginning from 1978-79. The indices of crop production efficiency under different crop groups were compiled on Kendall's method of 1939. The study reveals that the arid districts of Punjab were by and large highly efficient in crop production. Exception was, however, discernible for oil crops where it had turned out to be on lower scale of production efficiency. In case of Haryana the two arid districts gave varied degrees of efficiency in the prduction of different crops. From the analysis it is amply clear that arid regions located in the states of Rajasthan and Andhra Pradesh have registered

production efficiency of crops which require corrective actions more urgently than their counterparts in Punjab, Haryana and Karnataka. They may include consolidation of holdings, irrigation facilities, marketing infrastructure and provision of technological inputs.

(Salahuddin Qureshi)

E-3 : 13

S.P. SHUKLA, "Planning for Agricultural Development in Arunachal Pradesh", *The National Geographical Journal of India*, Vol. XXX, No. 3, Sept., 1984, pp. 191-98, 3 Diagrams

Arunachal Pradesh is essentially mountainous, forested, thinly populated and heterogeneous in socio-cultural traits and language and beliefs. Agriculture holds 94.6% of the people in its fold. The man-land ratio is highest but the man-culturable land ratio is very low. In Arunachal Pradesh the bio-physical environment firmly stands for jhuming but modern agricultural planning strongly emphasises the need to spread permanent system of agriculture. However, the planning of agricultural development in Arunachal Pradesh poses some serious problems. Jhuming practices have so far been most prevailing type of cultivation. The measures to replace such a practise of shifting cultivation by sedentary agriculture need an exhaustive programme to implement with utmost care. The operation of ecological process of agriculture promoting quality of life in such an inaccessible region with several constraints of biophysical milieu is complex and needs scientific approach. Gainful returns from the agricultural operations are the priority programme of the people in the field. But to make these gains permanent and lasting one has to think in terms of long-range planning.

(Salahuddin Qureshi)

E-4 : 14

M.M. DAS, "Crop Combination Regions of Assam : A Quantitative Analysis", *The National Geographical Journal of India*, Vol. XXX, No. 3, Sept., 1984, pp. 165-72, 8 Tables, 2 Maps.

The study of crop combination or association regions provides a basis for agricultural planning. Crops are principal index of agricultural typology and an agricultural region is often named after the dominant crop. The crop combination technique attempts

simplification by eliminating some crops of lesser importance and retaining the more important ones. In this work four methods of analysis have been used, namely, Weaver's method, Nelson's method, simple percentage and ranking method. A comparison of these methods has also been made to select the most useful one that may be relevant to the situation in the study area. The frequency distribution of crops shows that not a single crop is economically important in all the districts with the exception of rice in few areas. Interestingly enough, pulses are important in those districts where wheat and jute are important and also where crop diversification is highest. Such regional variation in distributional pattern of single crop and crop-combination, as well as crop-diversification-cum-concentration is mainly due to the variable combination of heterogeneous growth factors of the four selected techniques, Nelson's technique is the most suitable one for finding out crop combinations and delineating cropping regions in Assam.

(Salahuddin Qureshi)

E-8 : 15

R. RAM REDDY, N.V.N. RAO and P.V.S.R.L. SARMA, "Impact of minor irrigation on productivity and Employment in a Drought-prone Area", *Journal of Rural Development*, Vol. III, No. 4, July, 1984, pp. 346-53, 6 Tables.

In this paper an attempt has been made to study the impact of investment in minor irrigation projects and their viability in terms of increase in irrigation potential, changed cropping pattern, cropping intensity, incremental income, employment generation, cost-benefit ratio, net present worth and internal rate of return in a drought-prone district - Mahbubnagar in Telangana region of Andhra Pradesh. The financial institutions covered in this study are the Primary Agricultural Development Bank (PADB) and Union Bank of India (UBI). The total number of villages and cultivators selected for the study was about 10% and 15% to the total number of villages and cultivators covered and financed for the new-well and new-well-with-pumpset respectively.

For assessing the net benefit accruing from the investment, preinvestment position has been obtained by taking 25 rain-fed cultivators assuming that the characteristics of rain-fed cultivators, farm practices and returns will be similar to the pre-investment position. Since most of the sample borrowers had availed of loan from 1976-77 to 1980, it was found very difficult to collect precise data on pre-investment period of these borrowers.

The analysis indicates that there has been a considerable impact of investments in minor irrigation projects on the development of the drought-prone area, especially in terms of change brought about in the cropping pattern, yield rates and incremental income.

The authors insist that investment in minor irrigation be augmented suggesting the government to take a major responsibility by providing incentives in the shape of subsidies and financial institutions taking interest in advancing the loans for minor irrigation.

(Anil Kumar Jha)

E-9 : 16

N.K. NICHOLSON, "Landholding, Agricultural Modernization, and Local Institutes in India", *Economic Development and Cultural Change*, Vol. XXXII, No. 3, April, 1984, pp. 569-92, 1 Table, 1 Diagram.

India's experience with the green revolution offers fertile ground for examining current paradigms for understanding social change in the developing world.

This paper is an attempt to examine the impact of the green revolution in Punjab, and to review the debate. Further, the states of Punjab and Gujarat have been compared to examine the access of the benefits by the green revolution. Both the states have extremely progressive and dynamic rural economy, but Gujarat lacks in ample groundwater and well-developed irrigation system that made the green revolution successful in Punjab.

The author has computed the landholding patterns which prevailed in 1961 and 1971. On the basis of Gini's coefficient calculated for both Gujarat and Punjab represent the concentration of land i.e., the operational holdings. The Gini's coefficient for operational farm holdings in Punjab increased from 0.38 in 1961 to 0.63 in 1971. Subsequently, the land concentration, (Gini's Coefficient) were also computed for the irrigated area (in percentage) and population density; irrigated area (in percentage) and cropped area in HYV; population density and percentage of cropped area in HYV wheat.

The role of cooperatives in the spread of new technology, price levels, fertilizer import and distribution policies, rural

electrification, and well-regulated markets were also considered as the important factors influencing profitability.

The author has taken into consideration the role of credit supply to the farmers, and its specific impact on the agriculture, particularly on the farmers whose landholdings are small or marginal. The study presents more interesting aspects that the pattern of benefits is not coexistent with a power politics model of institutional behaviour. The institutions were biased toward commercially "progressive" agriculture and not toward landlords and large farmers *per se* at least in Punjab.

(H. Rahman)

E-11 : 17

M. SHAFI, "New Sources of Food - a study in Food Systems", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 10-13.

The author suggests that the use of non-conventional sources of food such as those obtained from oil, protein food from leaves and the like may augment total availability of food in India. He also suggests that animal manures may be recycled for livestock feed. Among the new sources of food leaf protein, single cell protein and insect protein are important.

Leaf proteins have a biological value of 70 to 80 per cent and protein efficiency ratio of 2.16 against 2.70 for skimmed milk. They also contain about 20 basic sets of amino-acids of which 10 are essential and 10 are non-essential.

The use of micro-organisms or single cell protein if allowed for consumption is beset with difficulties as it affects gastro-intestinal tract.

As regards insect protein, it may be pointed out that a number of bacterial species have potential use as food and their protein content can be quite high. In terms of quality, bacteria usually contain all the essential amino-acids and substantial amount of vitamins.

The author is of the opinion that the need for protein in the human diet cannot only be derived from meat, fish or vegetables

but also from wastes derived from cotton, and paper mills and even from animal manures. In this direction mushrooms play an important role as they transform valueless wastes into highly acceptable nutritious food. There are, however, certain limitations in the use of new sources of food.

(M. Farooq Siddiqi)

INDUSTRIAL GEOGRAPHY

F-6 : 18

V.P. SUBRAHMANYAM and K. M. MOHAN CHOUDHRY, "Impact of Urbanization on Coastal Climates", *Urban India*, Vol. IV, No. 3, June, 1984, pp. 3-8, 2 Maps.

The paper deals with the impact of urbanisation-industrialisation on coastal climates of India. The Indian sub-continent with its long coastline and varied relief experiences a wide spectrum of climatic peculiarities which are extremely important in the context of coastal zone development and management.

Among the various human factors which cause climatic modification both at macro and micro level, the rapid pace of industrialisation and urbanisation is significant. Compact masses of buildings, masonry structures and concrete pavements contribute towards a profound alteration of the natural landscape and the urban-industrial activities exert considerable impact on the temperature conditions.

Authors observe that coastal areas offer best location for development of urban-industrial centres. To that order they suggest that a thorough study of coastal climates of our country and the impact of urbanisation and industrialisation on them is very essential and urgent prerequisite through model techniques.

(Anil Kumar Jha)

F-6 : 19

A. SENGUPTA AND V.S. PHADKE, "Impact of Industrial Estate on the Surrounding Area (A Case Study of Dhatav, Roha)", *The National Geographical Journal of India*, Vol. XXX, No. 1, March, 1984, pp. 40-52, 7 Tables, 11 Maps.

The present paper makes an attempt to highlight some of the constraints of development. Industrial estates are slowly contributing to changes in the socio-economic structure in the surrounding area. The present study relates to industrial estate at Dhatav a small village, 4 km. east of Roha in raigad district of Maharashtra. The estate is located on the left bank of river Kundalika, some 80 km. south of Bombay on konkan-Goa Road. The impact of industrial estate has been measured from three different view-points : creation of market for local raw materials, creation of wage-goods and benefits to local people and other socio-economic effects on the area.

The analysis suggests that the industrial estate is simply an outlier of the metropolitan economy and has very little relationship with regional economy and aspirations. There is generally no attempt to exploit the regional potentialities in the form of raw materials and labour and the employment opportunities have only marginally benefitted the local society. It is suggested that the multiplier effect to be observed by proliferation of linked activities should be encouraged for certain positive socio-economic advantages.

(Salahuddin Qureshi)

GEOGRAPHY OF MARKETING, TRANSPORT AND COMMUNICATIONS

G-7 : 20

G. S. MEHTA, "Roads and Area Development : A study in Utilisation and Impact", *Indian Journal of Regional Science*, Vol. XVI, No. 2, 1984, pp. 170-77, 7 Tables.

The study attempt to assess the impact of road transportation on the rural economy of the hilly district of Almora. A primary survey conducted during the year 1979-80 reveals that most of the households were primarily dependent on agriculture. Due to small holdings and lack of infrastructure, agriculture is merely of a subsistence nature. The landless households are engaged in either household industries such as, spinning and weaving of woollen yarn, carpentry, blacksmithy, masonry and tailoring works, or as wage earners in agricultural or non-agricultural activities.

Most owners of establishments consider the opening of road transport as a significant help and beneficial for their economic pursuits. A large number of them, around 40 per cent could start their present activity solely due to the coming-up of the road, and

around one-third could expand their business. This is true for all cloths and kirana shops and most tea stalls and general stores. The artisan and processing units, however, did not find the development in transportation network in their favour, although it helped these units to procure their raw materials more easily.

(R. K. Mandal)

POPULATION GEOGRAPHY

H-2 : 21

M. HASEENA HASHIA, "Population Growth in Jammu and Kashmir State", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 58-63, 4 Tables, 2 Diagrams.

Jammu and Kashmir state constitutes 0.84 per cent of the total population of India and ranks 16th in terms of population in the country. The distribution of population in the 14 districts of the state indicate that Jammu containing 15.60 per cent of the state's population is the most populous district, while Kargil and Ladakh are the most thinly populated districts. The author has described the trends in growth of population in different districts during 1951-71 and urban population growth for the period 1901-1981 and the trend of urban and rural population change during the decade 1971-81.

An analysis of population variation in 1951-61 and 1961-71 points to a tremendous increase which was nowhere less than 110 per cent but varied to a maximum of 915 per cent.

(M. Farooq Siddiqi)

H-2 : 22

FAKHRUDDIN, "Growth and Distribution of Population in Lucknow City", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 64-74, 4 Tables, 3 Maps.

Population growth in Lucknow is a reflection of general trends of urbanization in India. It shows a remarkable correlation with its economic, social and administrative functions. An interesting feature of population growth in Lucknow is that it has shown a strong negative relationship with the spatial patterns of population distribution indicating saturation of densely populated areas around the old city centre. The density decreases away from the city centre. This spatial pattern of population distribution is in close conformity with the general model of urban population density in the cities.

The spatial patterns of population growth and distribution make it clear that the core of the city has reached a stage of saturation and thus cannot support further growth of population. As a consequence of the highly congested inner areas they have turned into slums with over crowding, substandard housing, lack of housing and civic amenities and open or green spaces. The over congestion in the city centre compels incoming migrants and growing families within the city to take refuge in unhealthy pockets of the fringe areas generally resulting in the growth of squatter colonies. The slums are spilling over from the city centre. The buildings in these colonies are flimsy huts. Such residential areas are almost devoid of all kinds of services and amenities of urban living. It is concluded that the trend of population growth and its pattern of distribution have contributed a great deal to the degradation of the quality of life in Lucknow city.

(M. Farooq Siddiqi)

H-2 : 23

(Smt.) T. D. SINGH, "Urban Population Densities : Some Cases of Spatial and Temporal Variation", *Philippine Geographical Journal*", Vol. XXVIII, Nos. 3-4, July, 1984, pp. 119-27, 1 Table, 1 Diagram.

Population distribution with respect to time and space have been analysed and negative exponential models are fitted to highlight the decline in urban densities away from the city centre. The study takes into consideration the six cities namely, Kanpur, Lucknow, Varanasi, Meerut, Dehra Dun and Jhansi of Uttar Pradesh. Emphasis is laid on density patterns and areal expanses of the cities in selecting the inter-ring-width. Computed densities of the rings and the corresponding distances from the centre (mid-ring distances) were plotted on semi-log-graph and the estimated lines of best fits were drawn. Following inferences were deduced from the plots:

The density declines with distance in all the six sample cities, showing high negative relationship, which is also supported by the values of correlation coefficients. The density gradient falls off more steeply in small-sized cities, as is expressed by the values of regression coefficient.

(H. Rahman)

H-3 : 24

FARASAT ALI SIDDIQUI, "Rural/Urban Population Age Structure Regions of Uttar Pradesh", *Transactions of the Institute of Indian Geographers*, Vol. VI, No. 2, July, 1984, pp. 15-25, 6 Tables, 2 Maps.

This paper has two sections. The first is oriented towards the identification of rural/urban population age structure regions of Uttar Pradesh, based on age structure index. The second examines the relationship between age structure index and a set of independent variables. This paper is based on the 1981 census data for the districts of Uttar Pradesh.

The general pattern of age structure of population of Uttar Pradesh is characterised by a general uniformity in the distribution of age groups. But the age structure indices obtained by decennial age groups are not uniformly distributed among the rural and urban components of population in the districts. The graded distribution identifies a somewhat continuous zone of high rural index in western and southern parts and the regions of less than the state average in the northern part of central and eastern plains. The urban index for the state is at par with the maximum indices of the districts obtained for rural population which indicates that urban population is relatively younger in composition.

(R. K. Mandal)

H-5 : 25

S. N. SINGH AND H.L. SHARMA, "A Study of Pattern of Out-Migration: A Regression Analysis", *Journal of Rural Development*, Vol. III, No. 3, May, 1984, PP. 168-74. 3 Tables.

Rural to urban transition involves the movement of millions of people from rural areas and provides the main mechanism of population redistribution. This paper has studied the existing levels of fertility, mortality and migration in three types of villages at different levels of socio-economic development. The survey has been done for 3,514 households spread among 19 villages in the district of Varanasi. The migration record consisted of questions relating to present age, age at migration, year of migration, place of migration and occupation of migrated persons. Authors have studied only the present status of migrants. Due to a small number of female migrants, the paper deals with male migration only.

The total migrants from a household has been considered as the dependent variable in the period under consideration and it has been explained by the percentage of households owning land by less than four 'Bighas', the percentage households belonging to the upper caste group and the distance of the village from the nearest town (in km.).

The paper concludes that the unequal distribution of resources in the villages is a key factor in inducing migration but where the proportions of households belonging to upper caste are more, out-migration rates are also high. This is true for other two variables too. The coefficient of determination (R^2) shows that the model gives a satisfactory representation of outmigration at village level.

(Anil Kumar Jha)

H-5 : 26

B. BANERJEE, "Rural-to-Urban Migration and Conjugal Separation : An Indian Case Study", *Economic Development and Cultural Change*, Vol. XXXII, No. 4, July, 1984, PP. 767-80. 3 Tables.

The purpose of this paper is to examine the pattern of incidence of conjugal separation among migrants in India. The analysis is based on data collected in the first stage of sample survey in Delhi which the author conducted in 1975. The Section I of the paper gives the general aspects of conjugal separation and explanation, section II examines the simple relationship between conjugal separation and a selected number of socio-economic variables, and in Section III estimates a linear probability function for conjugal separation. The findings are summarized in Section IV.

The evidence obtained from the sample area, i.e. Delhi, indicates that during the period 1956-75 there has been a slight decline in the tendency of migrants to leave their wives in their place of origin.

The author has taken into consideration the conjugal separation in the context of duration of urban residence, education, age at time of arrival in the city, caste, occupation, and region of origin.

The study makes an assessment with the help of regression analysis of the factors which have a direct bearing on conjugal separation. The estimate is made by a linear probability function for conjugal separation using the ordinary least squares procedure. The independent variables included in the regression equation are : duration of urban residence, education, and age at time of arrival in

Delhi. Caste is a dummy variable equal to one if the migrant belonged to the scheduled caste group, and equal to zero otherwise. Occupation is represented in the equation by a set of 17 dummy variables with "professional, technical, administrative, and executive workers" being the omitted group, and region of origin is represented by a set of 7 dummy variables with migrants from "rest of India" being the omitted category.

The probability of conjugal separation has yielded different results on different sets of variables.

(H. Rahman)

SETTLEMENTS : RURAL

I-2 : 27

MINATI SINGH, "Evolution and Distribution of Settlements in Lower Ganga-Ghaghara Doab during the Muslim Period", *The Geographer*, vol. XXXI, No. 2, July, 1984, pp. 34-35. 3 Maps.

The lower Ganga-Ghaghara Doab comprising the districts of Azamgarh, Ballia and Ghazipur (excluding Zamania tahsil) was under Rajput rule from 7th to 12th century who influenced the cultural scene of the area. The downfall of Rajputs was followed by the emergence of Muslim power which has its impact on the settlement and socio-economic system of the region. During the Muslim period three patterns in the evolution of settlements could be observed : (a) establishment of new centres, (b) revival of the old cites, and (c) alteration and renovation of existing settlements. The settlements established or developed during the Muslim period were generally named after the members of the ruling family or other chieftains. Some roadside settlements developed as stage points for travellers. The administrative headquarters of Sarkars, Dasturs and military outposts also attracted business activity and as such fortified markets grew. These markets were often controlled by the respective administrative officials.

The Mughals followed a tripartite territorial system of administration consisting of Subas (provinces), Sarkars (divisions) down to Dasturs. The Dasturs had the sub-divisions as Parganas down to a lower scale of Mahal, Tappas and Turufs as successive lower order revenue units. These resulted in the establishment of hierarchical administrative centres.

The peaceful rule of Akbar created an atmosphere for the development of industries and many industrial settlements were

established. During the last phase of the Mughals heavy taxation on agricultural activities induced a deterioration in social and economic conditions in the area. Handicrafts and other economic activities suffered and the growth and spread of settlements was hampered.

(M. Farooq Siddiqi)

I-3 : 28

SMRITI BANERJEE, "Location Difference from the Settlement and Pattern of Landuse in Village Parmanandpur (U. P.)", *Indian Journal of Regional Science*, Vol. XVI, No. 2, 1984, pp. 143-49, 4 Tables, 2 Maps.

The study of the village Parmanandpur has been done with a view to show the impact of the sources of irrigation in locating the landuse type. In this village the private pumping sets and Government tube-wells are the main sources of irrigation. An intimate relationship between intensity of irrigation and rural use of land is quite obvious. The pattern of land use of the village shows a relationship with varying distance from irrigation facilities. The new agricultural strategy has brought scientific and technological revolution in agriculture. Among the various biological and technological inputs, intensity of irrigation works as a main factor in agriculture. The successful cultivation of short duration new high yielding varieties of seed depends mainly on proper irrigation of the fields in proper time.

A major part of the village has been devoted to the cultivation of wheat and paddy crops. However, the fields lying beyond the distance of 400 metres face the problem of irrigation and that is why a large part of it is under the cultivation of other inferior varieties of crops like maize, jowar and bajra.

The pattern of land use resembles the pattern of intensity of irrigation. More than 60 per cent of the total cultivated area is situated in the middle part of the village. Intensity of cultivation is also high in this part. About 94 per cent of the total cropped-area of this zone is under double cropping whereas it is 90.18 and 44.27 per cent in the zones of 0 to 200 m and beyond 400 metres respectively. Due to irrigation facility the important crops like wheat and paddy are intensively cultivated in the middle part.

(R. K. Mandal)

I-6 : 29

SAYEED AHMAD KHAN, "Hierarchical Grade sand Functional Continuum", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 75-85, 2 Tables, 2 Maps, 1 Diagram.

The author while attempting to understand the characteristics of Punjab, presents a vivid review of earlier works on the subject. The study is based on numerical values assigned to eight important services of the state which were plotted on the graph against the population size of respective centres. It was observed that there were certain breaks in the system of hierarchy of central places which helped in measuring the variety as well as the level of functions of each one of them. Four levels or grades viz. regional centres, sub-regional centres, medium-sized centres and small centres were identified in a hierarchical sequence.

According to this exercise the author finds that there were four regional centres in the state which have an overwhelming influence on the system of settlement in the state. Nine sub-regional centres had significant influence extending over wider areas. The third order centres, 22 in number, were primarily medium-sized central places. Small-sized centres lying at the lowest level of hierarchical scale are largest in number, i.e. 70 and are widespread their in occurrence.

The distribution of central places in Punjab brings out the following features : (i) Regional central places are unevenly spaced and are linear in arrangement lying along road and main railway routes; (ii) sub-regional centres were more evenly spaced and their location was influenced by transport lines; (iii) medium sized central places were more or less evenly spaced and had developed because of their proximity to the regional centres ; and (iv) small sized centres are widely distributed.

(M. Farooq Siddiqi)

SETTLEMENTS : URBAN

J-2 : 30

RAJ BALA, "Urbanisation in Rajasthan State", *The National Geographical Journal of India*, Vol. XXX, No. 1, March, 1984, pp. 13-20, 4 Tables, 1 Map.

The paper is based on the hypothesis that dominance of one city is not visualised on the urban pattern because the state of Rajasthan was formed by the merger of a number of erstwhile states. The urban nodes which were capital cities of native states would make a multi-nodal pattern in the state. At a low level of development, it is expected that this class-favoured urban process would continue. The physical background on which this process started would continue its influence. The plain area which is dynamic would experience relatively faster growth in comparison to hill and dry areas.

Out of 194 towns and urban agglomerations Jaipur is the only million city. Out of 197 tehsils 58 were entirely rural and 17 of them got their first urban populations in 1981. The paper reveals that in general there is an improvement in the growth of towns. Two-thirds of the towns recorded a growth rate of more than 30 per cent. The intra and inter-regional variations were less in the growth of towns. The dry regions recorded the fastest growth closely followed by hills and plain areas. During 1971-81 also this region was under the grip of successive droughts. The urban centres gained population due to rural-urban migration. The rural economy is backward due to lack of water. Towns in Nagaur district experienced fast growth with the improvement in salt mining and trade. Towns in Ganganagar district show exceptionally high growth rate due to acceleration in commercial agriculture and agro-industries. Urbanization in Rajasthan has brought out mixed results of modern and traditional traits. Hence, most of the postulated hypotheses are partly supported.

(Salahuddin Qureshi)

J-3 : 31

KUNTALA LAHIRI, "Urban Growth and Changing Size-Class of Towns", *Indian Journal of Regional Science*, Vol. XVI, No. 2, 1984, pp. 158-69, 5 Tables.

An attempt has been made in this paper to examine and analyse the growth and changing size-class of towns. For the purpose, the census figures for the towns of lower Damodar valley were used. The three districts of Burdwan, Hooghly and Howrah of this triangular region form one of the highly industrialized-urbanized regions of India.

About 55 per cent of the urban population of the region presently lives in class I cities, while those urban centres in the class V and VI categories support only around 9 per cent. In general, the towns of the region show a lack of proper articulation of the settlement hierarchy.

Moreover, as the bulk of the towns cluster along the diagonals of the matrices, size-class change with urban growth usually takes place only to the next higher category. The standard classification of towns in various size-classes provided by the census of India on the basis of population has been used in this paper. Looking at these more closely it will become apparent that while a class V town will need to double its size within a decade to reach the midpoint of the next size-class from the midpoint of its former class, a class IV or III town will require more than just that. Thus, the magnitude of importance attached to the size-class change of small towns is less than medium and large towns.

(R. K. Mandal)

J-3 : 32

DEVKI, NANDAN PRASAD, "Integration of Rural-Urban Growth : Role of Service and Market Towns", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 7-11.

This paper seems to be prescriptive in nature. The author has discussed the changing nature of rural-urban relations, urban development, functional linkages of small and medium towns and implications of urbanization policies as enshrined in various five year plans.

The author states that agriculture constitutes almost half the national income and provides employment to about two-thirds of the people. Yet the importance of urban areas cannot be underestimated. Towns of various sizes have performed the commercial functions for centuries even when villages were more or less self-sufficient. Today, when growth of agriculture itself depends on modern technology and industry, rural development cannot take place in isolation. The development of small and

medium towns as service and market centres for agriculture offers a more promising prospect. Clusters of villages and towns with close interlinkages could be taken for integrated (rural-urban) growth to form regional complexes. This will open new vistas for local employment. However, the extent to which such a plan could regulate migration to large cities will depend on whether regional development is fast enough to offset the growing number of the job-seekers. Even without conscious effort such growth has taken place in the green belts of the Punjab, Haryana and western Uttar Pradesh. The author suggests that with the extension of modern agriculture, this experiment could be extended throughout the country.

(Anil Kumar Jha)

J-3 : 33

MEHAR SINGH GILL, "Growth of Urban Population in Punjab, 1971-81", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 22-31, 7 Tables, 2 Maps.

During 1971-81, Punjab recorded the highest growth rate in its urban population as compared to any other decennial period since the beginning of the regular census in 1881. It is primarily connected with the success of green revolution in the state which phenomenally affected the patterns of rural income distribution, amount of agricultural surplus and widespread diffusion of new agricultural technology. The period 1971-81 was marked by not only a rapid pace of urbanisation but also a significant increase in the proportion of scheduled castes in urban population.

The author has discussed the causes of accelerated growth of urban population in Punjab in relation with size and growth of urban centres, trends in the urbanising Scheduled Caste population and the spatial variation in the growth pattern in Punjab.

The Scheduled Caste population increased at a faster pace than the non-scheduled castes. This attributed to sizeable in-flow of the former from other states of the country. The commonly expected strong positive relationship between size and growth rate of urban centres was not observed. In fact, both the bigger and smaller towns experienced a higher growth rate than the medium-sized urban places.

Relatively high growth rate of urban population was observed in the urban centres located on the Rajpura-Graya industrial belt along the Amritsar-Delhi railway line, and in parts of the western Malwa region with higher level of commercial agriculture.

Conversely, low growth rate was recorded in urban centres lying in the tract adjoining the border with Pakistan, in towns along the Punjab-Haryana boundary, and in towns suffering from the urban shadow effect of bigger urban places.

(Anil Kumar Jha)

J-3 : 34

K. V. CHITHRANJAN, "Urban and Regional Growth Pattern in Gujarat : A Cross-section Analysis", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 32-40, 6 Tables.

Regional disparity is a major issue for the regional policy makers. This paper examines the pattern of distribution of urban population and industries in Gujarat. The paper also takes due note of the existing spatial and regional development policies in the state.

The analysis of spatial patterns of urban growth in Gujarat brings out that the urban growth is spatially concentrated in select pockets. Further, urban concentration shows accentuating trend over time and that the districtwise urban growth is found to have been restricted mainly to the largest urban centres.

The study has shown a positive association between the level of concentration of industries and the degree to which regions are urbanised. Industrial development in Gujarat has been highly concentrated in selected pockets. Industries are mainly located in the narrow corridor of Ahmedabad-Bombay transportation line. A simple correlation between urbanisation and industrial concentration - measured in terms of manufacturing employment - was observed to be very high. The author suggests that the dispersion policies with regard to industrialization and urbanization need to be reviewed and strategies evolved to effectively carry out the objective of balanced and equitable regional development.

(Anil Kumar Jha)

J-3 : 35

R.N. SINGH and R. K. PATHAK, "The Delimitation of Growth Centre Regions in Faizabad District (U. P.)", *Indian Journal of Regional Science*, Vol. XVI, No. 2, 1984, pp. 150-57, 1 Table.

The study attempts to delineate the zones of influence of growth centres in Faizabad District of Uttar Pradesh. On the basis of 'average centrality', method in the region 57 growth centres were identified in the first category. Among 57 growth centres, 45 are primary, 9 are secondary and the rest 3 are tertiary growth centres performing 12.3 to 32.5 per cent, 32.6 to 63.3 per cent and 63.4 to 100 per cent of the selected growth functions respectively.

It is noteworthy that Faizabad-Ayodhya is the apex growth centre of the study region notwithstanding that it serves merely 58 villages. Jalalpur is the secondary growth centre but it serves the largest number of villages, i.e. 176. The reasons are quite obvious. There are 6 centres around Faizabad-Ayodhya performing functions at lower level to the surrounding area. On the other hand, Jalalpur has no growth centres even at a primary level in its villages, i.e. 5 in the study region, because of its lower order between the two higher growth centres.

The complementary regions of growth centres vary both in terms of population size and the areas served. It is also marked that the bigger the population size of a centre, the greater is the area it serves. Bikapur is the only exception. In order to show the relationship between growth centres and their respective tributary population, co-efficient of correlation was worked out, ($r = 0.77$) and regression line drawn which exhibits a positive correlation.

The average number of villages served by each centre in the district is 47. Similarly, the area as well as population served by each growth centre are 77.6 km^2 and 33,812 persons respectively.

(R. K. Mandal)

J-4 : 36

RAJ BALA, "Spatial Patterns of Municipal Finance in Rajasthan State", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 12-21, 9 Tables, 1 Map.

The Municipal administration in India has remained a neglected field of study. Rarely an effort has been made to understand the regional variations in municipal administration in its various aspects. In this paper an attempt has been made in this direction through a case study of Rajasthan. Its scope is, however, confined to the financial administration in the state.

The author has hypothesised that the civic status of a municipality would be a crucial factor in determining its income and expenditure pattern. Higher the civic status, the greater would be its potentiality to raise local resources by virtue of greater financial powers. Further, municipalities with a large population size would accumulate higher per capita revenue as compared to those with small population size. It is also hypothesised that the older municipalities would have higher income in comparison to the newer ones; and that the municipalities with manufacturing, commerce and transport as their dominant functions would have higher revenue than those with services or primary activities or household industries as their dominant functions. Finally, the municipalities located in more developed areas would be in a better financial position than those located in the backward regions.

The analysis of data by the author reveals that the civic status is critical in determining their income pattern. The income of the eleven top ranking class I municipalities was distinctively higher than that of the class IV municipal boards at the bottom. All hypotheses suggested by the author are found to be valid. Spatially, municipalities located in the relatively developed regions or in the backward tribal regions had comparatively high per capita income while those in the desert had the lowest. The inhabitants of the municipalities contribute hardly 10 to 15% to municipal revenue as the remaining is obtained as octroi and as grants received from the government.

(Anil Kumar Jha)

J-4 : 37

A. K. SHARMA, "City Primacy in Developing Countries : A case study of India", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 1-6, 3 Tables, 1 Diagram.

This paper examines the association between development and city primacy in India. A composite index of development has been worked out in order to measure the relationship between the two. The statistical relationship between the relative change in primary during 1971-81 and development has also been examined.

Further, to investigate whether the cities in developing countries follow a city-size distribution, the case of Iran (1976) and Chile (1980) have been discussed. In order to understand the

Indian situation, which is the purpose of this paper, two indices of urban primacy used in the study of developing countries in general have been suggested.

The correlation analysis suggests that primacy of city is highly correlated with migration and least with the levels of development. The models for the two indices of urban primacy show a good "fit" for India. The analysis for India has been attempted at sub-national levels, discussing the inter-state patterns of migration, and its contribution towards growth of large cities which has been found to be a relevant indicator of city primacy, development and urbanization.

(Anil Kumar Jha)

J-6 : 38

MEHDI RAZA and HANIFA BANO, "Some Aspects of Limnology of Dal Lake", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 9-16, 3 Tables, 1 Map.

The Dal Lake in the Kashmir Valley plays an important role in the socio-economic life of people in the Valley. It is however now showing signs of serious disequilibrium in its ecological structure. If it is to be saved from total entrophication and restored to former glory, immediate curative and ameliorative action must be undertaken and this task in the opinion of the authors may be achieved by understanding structure and dynamics of the lake's ecosystem.

Dal is a shallow lake and is usually homothermal except during summer when slight temperature stratification may develop for brief periods. A study of the precipitation and water balance during the period 1964 to 1976 indicates that there has been no gain or loss of water in the lake.

Two principal nutrients in the lake are nitrogen and phosphorus. Nitrogen in the form of ammonia or nitrate is always present in almost all sections of the lake, but the level varies from season to season, from place to place and with depth. The recorded values of the surface and bottom layers being 1.69 mg/lit and 1.93 mg/lit respectively. The average level of phosphorus concentration in the lake is 1.31 mg/lit but there is considerable spatial and temporal variation both in the surface and bottom layers of the lake.

The level of dissolved oxygen (DO) is generally higher in surface water than in bottom water, ranging from 5.1 mg/lit to 13.0 mg/lit. The pH value ranging from 7.77 to 8.88 indicated the pollution of the Dal water.

(M. Farooq Siddiqi)

J-6 : 39

S. S. CHIB, "Demographic Landscape of Goa, Daman and Diu", *Indian Geographical Studies*, No. 21, Sept., 1983, pp. 25-32, 2 Tables, 2 Maps.

An attempt has been made in this paper to describe the demographic characteristics of Goa, Daman and Diu. The Union Territory of Goa, Daman and Diu in view of unprecedented population growth rate in recent decades as well as relatively higher arithmetic density depicts a high pressure on the land resource base. However, immigration during the recent decades has given spurt to the growth, outmigration to other parts of the country and Gulf States from these territories. As a result the areas of immigration show relatively low sex ratio while areas sending out male excessive outmigrants are characterised by higher sex-ratio. The coastal strips and islandic units show sex-ratio favourable to the females. The area ranks fifth on the literacy map of the country and has shown good progress in the field of female literacy. General awakening as a result of socio-economic progress and the remittances from Gulf countries have played considerable favourable role in this context. Initiation of many schemes aimed at the industrialisation of the region has resulted in a higher rate of urbanisation. The higher degree of urbanization achieved in turn has caused a shift in the employment pattern of the U.T. where during the recent decades workers have moved from non-lucrative traditional rural-based vocations of agriculture and household industry to modern urban-based professions. A new urban vocation is the tourist industry which has considerably augmented the income levels in the region.

(R. K. Madal)

J-7 : 40

MADHUSREE MAZUMDAR, "City Profile : Durgapur (1956-76)", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 47-54, 1 Table, 1 Map, 1 Diagram.

This paper narrates the manner in which Durgapur city (West Bengal) has acquired its present shape. Durgapur city came up as a planned industrial town based on the concept of 'garden cities', and received an impetus by the urban-industrial policy of the second five year plan.

The author feels that the industrial city of Durgapur has generally grown as a result of the different phases of industrial development, leading to discontinuous and incomplete built-up areas. The transportation routes and the physical characteristics (especially proximity of mineral resources) has guided the location of industries and the spatial form of the city.

The author has described the urban spread in three phases such as 1956-60, 1961-66 and 1967-75 respectively as the city started with the construction of the DVC barrage across the river Damodar in 1955 and grew into an urban-industrial complex within a period of 20 years. The process of urban spread is by way of infilling of vacant/agricultural land within the 40 'monjas' acquired by Notified Area Authority. Most of the industries are located on transport routes for ease of transportation of raw materials and finished products and nearness to river for industrial water procurement. The industrial townships are built in a linear fashion along the G.T. Road and are determined by nearness to respective industries, transport routes and the wind directions to avoid pollution. The spatial pattern of landuse in Durgapur is divided into three distinct strips (industrial, residential and the intermixture of the two) within which can be found pockets of self-contained urban-industrial neighbourhoods which are typical of industrialising regions. Only the first two decades of the city's growth have been discussed in this paper while the third phase has been left out in want of recent data.

(Anil Kumar Jha)

REGIONALISATION AND REGIONAL DEVELOPMENT PLANNING

L-1 : 41

U. P. SHAHI, "Changing Patterns of Urban Rank-Size Relationship in a Developing Economy : A case study of Gujarat-India", *Philippine Geographical Journal*, Vol. XXVIII, Nos. 3-4, July-Dec., 1984, pp. 100-9, 2 Tables, 1 Map, 1 Diagram.

The main objective of the paper is to examine the validity of the rank-size rule in respect to the urban centres of the study area (Gujarat), on the one hand, and to look into the changing pattern of urban rank-size relationship during the eight decades of the present century on the other. In order to make the study more analytical and explicit, the author has attempted to answer the following questions : (i) how far does the size distribution of the urban centres of Gujarat follows the rank-size rule? (ii) how does the size distribution of urban centres deviate from the theoretical norm ? (iii) what is the position of each urban place in the theoretical curve ? (iv) has the rank-relationship been stable during the last 30 years (1901-1981) or has undergone significant changes ? (v) if it has undergone significant changes, what has been the nature of change? and (vi) how much is the primacy of the primate city?

In order to examine the rank-size distribution of urban centres in Gujarat (9 double logarithmic graphs, showing population size on the ordinate and rank on the abscissa, were drawn for all the centres defined as urban at each census from 1901 to 1981, and a comparative analysis of all the graphs has revealed certain facts. For example, the study area had not been fully integrated into a functionally coordinated and interacting urban system, rather it represents a few urban sub-systems each having, more or less, its own rank-size distribution.

Finally, the study attempts to measure the degree of primacy of Ahmedabad city by the ratio of its population to that of the second largest city or to those of some other ranks of cities.

(H. Rahman)

L-3 : 42

SURYA KANT and K.N. DUBEY, "Spatial Structure of Administrative Units and the Development Process (A case study of Uttar Pradesh)", *The National Geographical Journal of India*, Vol. XXX, No. 1, March, 1984, pp. 31-39, 2 Tables, 3 Maps, 1 Diagram.

The main objective of the present paper is to examine the role of spatial structure of administrative units in development process. The paper is divided into conceptual, methodological and analytical sections. Spatial administration has two dimensions of spatial organisation and spatial structure. The spatial structure refers to the internal locational organisation in space. Spatial structure can be judged from the areal size, shape and locational eccentricity of

administrative headquarters in respect of territory it serves. Such attributes of an administrative structure of space would influence its management efficiency, resource allocations and investment utilization pattern of services and facilities.

On theoretical plane a compact administrative unit of manageable size with centrally located administrative headquarters and with an articulated interspatial structure would accelerate development process. A small size would have less distance barriers, greater mobility and low magnitude of area management problems.

To measure the quality of spatial structure area size, compaction index, centrality of headquarters and number of sub-units per thousand square kilometres of area are computed. A great regional variation exists in the spatial structure of districts with regard to their size, shape, locational eccentricity of headquarters and intra spatial development structure. The findings of the paper confirm a significant relationship between quality of administrative spatial structure and level of development. Among different attributes the area size is of greater significance. Its role is to be found greatest in agricultural and social development. Shape of unit and centrality of its head-quarters are not consistent in their impact on development.

(Salahuddin Qureshi)

L-5 : 43

K. N. SINGH and R.S. SINGH, "Levels of Regional and Tribal Development in Tribal Areas : Are they Identical ? " *The National Geographical Journal of India*, Vol. XXX, No. 1, March, 1984, pp. 1-12, 1 Table, 3 Maps, 7 Diagrams.

The paper hypothesizes that in a dominant tribal region, the levels of regional development should be commensurate with the levels of tribal development. Although, the data base for assessing tribal development is too fragile to support a definite statement, still an effort has been made to make it authentic through rigorous analysis. Generally, the efforts in tribal areas have led only to an area development which has not been conducive to the participation of tribals in the development. The regional development is desirable for development of tribal communities, yet the regional development may not be treated as an indicator of tribal development.

The study area is Ranchi district of Chotanagpur region which is richly endowed with forest and mineral resources. This is the only district of the state in which tribals constitute an absolute majority

of 58.08% population. There are 30 tribal groups living in different stages of socio-economic development. Nearly 97% of the tribals are rural.

The data used in this study have been computed on Block level. Relevant indicators of regional and tribal development have been selected. The value of different indicators added directly would have affected the composite index. Hence, the scale effect has been removed by applying the method of normalisation. As a result, all the blocks have been categorised into four levels of development, using median and quartiles for the grading.

The paper reveals that the spatial pattern of regional development indicate high magnitude of development is polarised around the city of Ranchi and distance from Ranchi city acts as a constraint in regional development. Viewing the result of the study in the light of tribals and non-tribals it is found that an overwhelming majority of non-tribals is in blocks which have highest level of regional development. The study reveals that level of tribal development is unidentical with level of regional development.

(Salanhuddin Qureshi)

L-6 : 44

M. SHAFI, "Rural Industrialization and Regional Development in India", *The Geographer*, Vol. XXXI, No. 2, July, 1984, pp. 5-8.

The paper focuses on the role of rural industrialization in regional development. Balanced development of a region can be ensured if agro-industrial base and the structure of small-scale and cottage industries are strengthened and established on a large scale particularly for those who do not find employment in land-based occupations. Small-scale rural industries like the manufacture and maintenance of simple machinery and implements, the milling of cereals, canning of fruits and vegetables, cotton ginning and tannings of hides and skins can provide additional employment opportunities in the rural areas.

The author points two ways for achieving the goal of rural industrialization. Firstly, through the expansion of handicrafts, small-scale industries and agro-based industries, and secondly, by promoting the decentralisation of industries from the urban to the rural sector. The spatial location of such industries has to be well-

planned including the development of socio-economic infrastructure.

For the success of rural industrialization the author suggests that industries be modernized to increase output per worker and marketing outlets be found for their products. At the same time artisans should be protected from exploitation by the middlemen. Technology in rural industries should be refurbished to meet export demands. The development of industrial units should be based on spatial approach leading to horizontal as well as vertical integration of the economy. The location of units should be based on properly surveyed resource endowment areas. The infrastructure should be properly examined before the location of units. The geographer with his training in spatial analysis and synthesis can play a vital role in building up a sound statistical data base and can help in the generation of employment.

(M. Farooq Siddiqi)

L-6 : 45

K.K. YADAV, "Rural-Urban Development : A new Dimension", *Urban India*, Vol. IV, No. 4, Sept., 1984, pp. 41-46, 1 Diagram.

A disproportionate concentration of activities and people in large cities and the lack of any marked break-through in rural development reinforce the dualism in national economy and increase the socio-economic gulf between the urban and rural settlements. According to the author a dismal picture is emerging, causing distortion in the rural and urban relations.

The author, in this, pleads for a fresh approach to spatial planning in the spirit of rural-urban continuum, which in his opinion will help in correcting such a situation. To this order due attention should be given to the distorted relationship between city and its hinterland; rural-urban dichotomies; anachronism in the planning process; strengthening the rural economic base; interlinking the system of settlements by incorporating the social and environmental aspect in an overall framework of development of settlement; utilising the scarce financial resources, and, creating an awareness of the spatial development process through public participation.

The interaction between one settlement and another in the settlement hierarchy is of considerable significance. The rural areas have remained mere 'appendages' for the urban enclaves. This must be reversed by a policy for rural urban continuum.

(Anil Kumar Jha)

EDUCATION IN GEOGRAPHY

N-2 : 46

B. L. SUKHWAL, "Geography in Indian Secondary Schools", *The National Geographical Journal of India*, Vol. XXX, No. 4, Dec., 1984, pp. 223-30, 1 Map.

The purpose of this paper is to evaluate the status of high school geography in India and make a simple comparison with the United States. In the contemporary world, the knowledge of geography should form a very important part of high school curriculum so that the coming generations will be well versed with the complex world patterns and issues. The university professors frame curricula, write textbooks and conduct refresher courses; and the teachers who teach the students only carry out the policies framed by university professors. The paper deals with the geographical teaching and learning in India through the ages. Geography was considered a very important branch of knowledge since the vedic era in India.

During the Rajput and Muslim periods, the study of geography became increasingly essential because emperors desired assimilation with existing cultures. The knowledge of various phenomena in a spatial context formed an important part in studies. The British period added to furthering the geographical knowledge by introducing scientific methods of investigation through practical fieldwork, surveying and cartographic techniques. As a result, the modern geographical studies in Indian schools have mainly borrowed from the British model. The curriculum, teacher training, the examination system and text-book production follows the British pattern with minor modifications curriculum planners in India should continue to add innovative geographic concepts and ideas at various levels.

(Salahuddin Qureshi)

PHILOSOPHY OF GEOGRAPHY

O-2 : 47

R. L. SINGH and R.P.B. SINGH, "Life World and Life Cycle in India : A Search in Geographical Understanding", *The National Geographical Journal of India*, Vol. XXX, No. 4, Dec., 1984, pp. 207-22. 1 Map, 6 Diagrams.

The paper claims that Indian literature provides prospects for innovative thought and action towards modern technological and scientific revolution in harmony with the human ethics. The bio- and geosciences are primarily concerned with issues of Man and Nature interactions. However, the orientation of ethics needs a fresh outlook. To promote the sense of humanity and personhood in geographic context the present paper attempts to highlight the holistic framework of thought and action emerging from man-nature interaction. Philosophy of life has been defined as spatio-temporal function of human activities and reciprocally their imprints on man-nature interactional system. This refers to the dynamics between constantly changing nature and never tiring man.

But in course of time man has followed relatively higher speed resulting into ecological imbalances and leading to the degradation of moral ethics of humanity. Man in his attempt to control the natural phenomena has resulted into environmental disturbances, while orderly and humane environment is the prerequisite for peaceful human society. The basic idea of "life world" in Indian philosophy is related with the notion of Mandala - the "Cycle whole". The scientific form of this concept has been proclaimed by zero (shunya). The mandala reflects the cosmic image when "man and earth correspond to one another in this image. Time enters the mandala by coordinating the signs of zodaic, and space does so by orienting the square towards the four cardinal points". The paper tends to seek geographical explanation of Indian religious philosophy.

(Salahuddin Qureshi)

O-3 : 48

HAR PRASAD, "A Note on the Quest For Geographical Theory", *The National Geographical Journal of India*, Vol. XXX, No. 4, Dec., 1984, pp. 231-35.

Geography has been defined in different paradigms in different nations of the world. Germany, France, the U.K., the U.S.S.R. and the U.S.A. have masterminded the colonialism in the form of physical, ideological and trade framework. Geography has diffused its pattern of paradigms from these five countries. The development of indigenous and derivative theories along with the use of descriptive, forecasting and planning models has inculcated a deep insight among thinkers in geography to conceptualize a unified theory of geography. In pre-sixties the concept of place was the main focus

in geography. During the 1960s there was prominence of space. In 1970s Yi-Fu played an influential role in blending space and place in developing new direction to human geography. The derivative theories of allometry, osmosis and diffusion, entropy and energy are fused together and have emerged in the form of theory of living state. The geographic theory as Unified Central Place Theory of living state needs verification in different cultural landscapes of the world by the spatial scientists. It requires its conceptualisation mathematically and graphically.

(Salahuddin Qureshi)

ENVIRONMENTAL STUDIES

P-2 : 49

HANIFA BANO, "A Note on the Problems of Pollution in Dal Lake", *The National Geographical Journal of India*, Vol. XXX, No. 4, Dec. 1984, pp. 255-58, 1 Map.

The Dal Lake is situated in the heart of the Valley of Kashmir and has shrunk to half its actual size during the past decades. The rapid urbanization, agricultural activities, deforestation and siltation have increased cultural entrophication in Dal water which is posing many problems for the health and well-being of this lake. It is of interest to study the main elements which have caused pollution in the lake. Deterioration having been caused mainly by the increase in volume of sewage effluents discharged.

The lake is shallow in nature with sluggish water flow. The temperature is warm and transparency is reasonably clear. Though total and available phosphorus is low, the content of ammonia nitrogen is very high in many parts. All these elements together make the lake both Entrophic and Mesotrophic in nature. It is seen in Dal lake at various places that due to the decay of weeds, their odour, at times is objectionable. The lake is characterized by extensive weed growth, increasing contamination of the water by untreated sewage. It is this condition which is making the lake increasingly unattractive as a source of recreation. The ecosystem of the lake is not stable and will become more vulnerable to deterioration unless the rate of nutrient accumulation is effectively controlled.

(Salahuddin Qureshi)

P-3 : 50

ANAND MOHAN, "Mineralization in Archaean Greenstone Belts : An Example from South Indian Shield", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 117-24, 1 Map.

The purpose of this review is to demonstrate and emphasize the mineral deposits found in Archaean granite greenstone terrains with special emphasis on the economically important mineral deposits of Indian Peninsular shield. In Karnataka Dharwar formations, almost all the copper occurrences are associated with basic volcanic or ultrabasic rocks of early Precambrian era. Archaean Nickel-copper deposits occur closely associated with ultramafic sills or volcanic rocks in greenstone belts. Economically important nickel occurrences in southern India have not come to light so far. The principal occurrences of Archaean gold is in quartz veins.

This paper attempt to highlight Archaean complexity and stresses the intimate relationship of processes and responses in metallogenic history of granite-greenstone evolution. Emphasis has been given to the economically important mineral deposits in the Peninsular Indian shield. Future progress in Archaean metallogeny depends much on the recent advances in isotope geology and rare earth geochemistry which would help in identifying target areas.

(Salahuddin Qureshi)

P-3 : 51

R. N. MATHUR AND K.S. YADAV, "Physical Basis of Water Resource Development and Utilitization - A Case Study of Chakia Tehsil, Varanasi District", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 92-104, 1 Table, 1 Map, 2 Diagrams.

The present study is an attempt to show how an understanding of the physical characteristics of an area is essential for a proper development and utilization of its water resources. Both the qualitative and quantitative aspects of the study have been duly emphasized. The influence of physical factors on the occurrence of water in Chakia tehsil and development and utilization of the water resources of the area has been studied. The future prospects of their

development have finally been examined in the light of these studies.

The study lays stress that climate and water balance conditions determine the availability of water whereas its occurrence, development and utilization are largely dependent upon relief and drainage, geology and rock structure, soil and the hydrological properties of rock-formations. In the study area, with almost uniformly similar climate and water balance conditions there are well-marked spatial variations in the occurrence, development and utilization of water resource. The plateau tract is characterised with low infiltration and high runoff rates and the plain tract by high rates of groundwater recharge and large ground water storage capacities so that surface water resources have mostly been developed in the plateau region and groundwater resources in the plain region.

(Salahuddin Qureshi)

P-4 : 52

R.S. MITTAL, B.C. JOSHI and K. GOHANI, "Environmental Impact of the Ram Ganga Dam Project", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 81-91, 3 Tables, 1 Map, 2 Diagrams.

The paper is an attempt at evaluating some of the environmental impacts consequent upon the functioning of the Ramaganga Dam at Kalagarh (U. P.) . The environmental impacts associated with the river valley projects have drawn wide attention of the environmental scientists. Many criticisms have been made by the environmentalists and conservationists on environmental problems stemming out of the dam construction. Ramaganga is a major rain-fed tributary on the left side of the Ganga. The impact assessment studies carried out so far reveal that the Ramganga Dam Project has partially disturbed the natural, environment.

(Salahuddin Qureshi)

P-4 : 53

R. S. YADAV, "Environmental Problems and Eco-Development Sub-Regions in South Mirzapur", *The National*

Geographical Journal of India, Vol. XXX, No. 4, Dec., 1984, pp. 259-68, 3 Maps, 1 Diagram.

The South Mirzapur Region is a small area of 4172.5 km². It has a large base of resource potential. On account of unplanned development and non-coordination in different development agencies, along with poor ecological perception the development process caused ecological imbalances and damage within a short period of three decades. The consequences of development activities led to the deterioration of natural environment. At the same time the problem of resettlement of the uprooted population by submergence of settled areas under the created reservoir became a challenging task. After the construction of hand Dam at Pirpri about 344 km² area of the basin was submerged. This area was endowed with fertile soil suited for cultivation and densely settled. In the downstream another reservoir was developed for hydel power generation. Resettlement of population had its adverse effect on the environment. In this paper various problems of the environment have been discussed in detail. In order to overcome these problems preventive as well as restorative measures should be adopted for proper utilization, preservation and improvement of the environment. The local resource based cottage industries have been recommended which will provide employment increase per capita income and human welfare.

(Salahuddin Qureshi)

HYDROLOGY

R : 54

O. CHALLA, "Hydrometric Study in Relation to Soil scape in Dadara and Nagar Haveli Union Territory", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 112-16, 2 Tables, 1 Diagram.

Detailed soil survey in Dadra and Nagar Haveli Union Territory was carried out and the important geomorphic units have been identified and mapped. An attempt has been made to study the effect of soil, besides the other factors contributing to different drainage parameters on various landforms with different soil units in humid subtropical parts of the area. Geomorphic analysis of the region was done on toposheets at the scale 1 : 50,000 sample of uniform size were selected on the major soilscape unit of study. On higher topography and hill tops are shallow moderately deep, medium textured Entisols and in plains and gently sloping piedmont region

are deep to very deep, heavy-textured, moderately well drained Inceptisols and Vertisols.

The study of drainage characteristics indicates that the total stream number is 65, 90 and 77 on the soilscapes of Entisols, Inceptisol and Vertisols respectively. It is stressed that the type of soils plays an important role in the formation of the streams. The hydrometric studies in the region revealed that the Entisol soilcape occurring on the flat topped hills and hill slopes has low stream number $65/15 \text{ km}^2$ as compared to Inceptisol $90/15 \text{ km}^2$ and Vertisol $77/15 \text{ km}^2$. The soilcape of Entisol has low bifurcation ratios, coarse drainage texture and high drainage density.

(Salahuddin Qureshi)

CLIMATOLOGY

S-1 : 55

K.P.R.V. MURTY and R. BHARGAVI, "Air Pollution Climatology As a Means of Pollution Management and Abatement Planning in India", *The National Geographical Journal of India*, Vol. XXX, No. 4, Dec., 1984, pp. 236-44, 16 Maps, 2 Diagrams.

The suitability of a particular geographic location for setting up of industries is mainly on the consideration of pollution potential of the area. In this article an attempt has been made to give a general picture of mixing heights and ventilation coefficients for India. This will help the environmental planner in choosing appropriate location for industries. The maximum and minimum mixing heights and maximum ventilation coefficients have been computed for 1963 by extending a dry adiabat from maximum surface temperature to its intersection with the early morning temperature profile of a nearby rural area. The seasonal variation has been studied in this article by considering January, April, August and October as representative of the winter, pre-monsoon, monsoon and post-monsoon seasons. Four coastal stations, six inland stations and one island station were taken. The value of mixing height for each day in the month and mean mixing height from the mean data has been estimated.

The study reveals that the maximum and minimum mixing heights for both inland and coastal stations differ considerably from station to station. The range of mixing heights was high for inland stations and low for coastal stations. The spatial distribution

of mixing heights suggests that extreme northern portions are pollution-prone because of low mixing except in April. The higher ventilation coefficients in April and August are favourable for rapid disposal of pollutants and emission schedule can be planned accordingly.

(Salahuddin Qureshi)

S-1 : 56

B.V.R. RAO, A.S.R. SASTRI and Y.S. RAMAKRISHNA, "Variations in the Moisture Regime of the Indian Arid Zone", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 73-80, 3 Tables, 2 Diagrams.

The paper studies variability of the moisture regime in the Indian arid zone considering decade-wise moisture index and distribution of years with extremely dry, dry and partly dry moisture regime and relationship between mean moisture index and probabilities of occurrence of extremely dry and dry moisture regime. The moisture variability was studied for the period 1901 to 1980. The coefficient of variation of moisture index decreases with decrease in moisture index indicating that stations with low moisture index will have stable climate while the stations with high moisture index will have large fluctuations in climatic pattern. Considerable variations occur in the moisture regime due to high variability in yearly rainfall.

The mean of annual rainfall and its coefficient of variation were calculated. The monthly water balance computations were carried out by Thornthwaite and Mather procedure and the moisture index values were calculated using Thornthwaite's (1948) formula. The coefficient of variation of annual rainfall is comparatively high at stations with low rainfall. The coefficient of variation of moisture index decreases with decrease in moisture index indicating that stations with low moisture index will have stable climate in western Rajasthan.

(Salahuddin Qureshi)

SOIL GEOGRAPHY

T : 57

SHAH ALAM and M.F. SIDDIQI, "Fertility Status of Soils in different Altitudinal Zones of Garhwal Himalaya", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 68-76, 2 Tables, 2 Maps.

The problem of soil fertility is of great importance in mountainous areas where only a limited area of land is available for cultivation. In order that this small area may be put to maximum agricultural productivity the authors have assessed the position of nitrogen, phosphorus and potassium - the three largely required plant nutrients in the soils of Garhwal Himalayas. It has been pointed out that there is an urgent need to assess the requirement of NPK in the soils of different altitudinal zones in order to suggest the amount of these nutrients required.

The soils of Garhwal Himalayas have been broadly divided into five types on the basis of altitude, viz. lithozols, podzols, podzolic soils, grey-brown forest soils and *bhabar* soils. The soil samples were collected from all the zones of different blocks and the results regarding the presence of NPK were grouped under five categories of very high, high, medium, low and very low corresponding to rich, moderately rich, average, deficient and poor status of soils.

The discussion brings out that the distribution of nitrogen, phosphorus and potassium in the soils of Garhwal Himalaya varies considerably with increasing height. The higher concentration of NPK is found in soils which lie at a height between 610 to 915 metres. On higher elevations their presence is relatively low. On the basis of the analysis the authors have pointed out that the zone lying between 610 and 915 metres is well suited to agriculture with regard to NPK. The crops may successfully be grown in this zone without the application of NPK fertilizers.

(M. Farooq Siddiqi)

T : 58

ABHA LAKSHMI SINGH and M. AJMAL ANSARI, "Fertility Status of Aligarh Soils", *The Geographer*, Vol. XXXI, No. 1, January, 1984, pp. 32-42, 3 Tables, 2 Maps.

The paper is an attempt at assessing the fertility condition of soils in district Aligarh (U. P.) . While doing so an attempt has also been made to understand the causes responsible for fertility variation and to suggest suitable remedial measures in order to help increase fertility levels of the deficient soils.

The soils of the district are mainly alluvial deposited by the rivers Ganga and Yamuna. The Department of Agriculture, Uttar Pradesh, has classified these soils into six types on the basis of physical features and watershed.

In an attempt to assess the fertility of soils, the authors in collaboration with soil survey team of the Soil Testing Laboratory, Aligarh, collected soil samples from representative villages of the seventeen blocks of the district and tested their chemical composition. It was found that the soils near the banks of the rivers Ganga and Yamuna are very rich in potassium and deficient in nitrogen and phosphorus. Proceeding towards the central lowlands potassium content slightly decreases and that of nitrogen and phosphorus slightly increases. The soils show poor mineralogical make up owing to poor drainage . As a result of high potassium content the soils become excessively alkaline in nature hampering the growth of microbial organisms.

In the light of existing condition the authors have suggested certain remedial measures to maintain high crop production in the face of declining soil fertility. As a first step the fertilizers should be used judiciously *i.e.* use of potash may be forbidden and more generous use of phosphorus and nitrogenous fertilizers may be taken up. Best results are obtained by the application of superphosphates. A balanced uses of NPK fertilizers is very essential for these soils.

The viability of nitrogen fixing microbial organisms can be enhanced by planting legumes, wheat, paddy and blue green algae fixers. Synthetic nitrogenous fertilizers can better be replaced by biologically fixed nitrogen. The excess use of fertilizers, pesticides, herbicides and other chemicals in the crop management pollute soil and may be checked.

(M. Farooq Siddiqi)

BIOGEOGRAPHY

U-2 : 59

L. N. BORA, "A Study of the Vegetation Types of North East India based on Climatic Zones", *The National Geographical Journal of India*, Vol. XXX, No. 2, June, 1984, pp. 105-11, 5 Maps, 2 Diagrams.

This paper endeavours to look for correspondence between vegetation types and climatic zones of the region according to Thornthwaite's 1955 scheme. Applying the book-keeping method of Thornthwaite and Mather, the elements of water balance like potential evapotranspiration, water surplus, and water deficit are computed for 20 stations for a period of nearly 80 years. The humidity index and moisture index were computed for each station. With the help of these indices the moisture and thermal regimes of climates of the region were mapped. This map has been compared with those of Koppen's climatic type and de Candolle's vegetation zones.

The climatic analysis linking natural vegetation needs a vegetation map of the region. Unlike Thornthwaite's scheme of climatic classification, Koppen's scheme fails to bring out significant diversity of the climates of Northeast India. The temperature of the coldest month that divides Koppen's Tropical and Warm Temperature climates of Northeast India is not 18°C but should be 15°C on the basis of vegetation distribution. The enquiry finds that for the study of natural vegetation associations of climatic zones, the water balance approach is the most powerful tool.

(Salahuddin Qureshi)

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B - POLITICAL GEOGRAPHY

B-1 : 1

S.K. SINHA, *Measuring Party Competition—A New Approach, Geographical Review of India*, Vol. XLVII, No. 4, December, 1985, pp. 1-6.

In this paper the author attempts to evolve a method for assessment of the competition between political parties in the Indian multi-party system with dominance of a single party as distinct from what is known as one-party system. A review of the methods currently used to study party competition in the Indian polity indicates that these methods have serious drawbacks and it demands for the search of an alternative technique which can give a comprehensive picture of the nature of party competition. The method evolved in this paper identifies the party-combination regions by modifying the formula put forward by Weaver and Doi used for delimiting crop-combination regions. Competition between parties is then measured by using the method of coefficient of variation. The coefficient of variation thus calculated has been divided into six categories -ranging from very high competition to very low, and insignificant competition. Thus, maps of party combination regions and degree of competition could be prepared. According to the author, the superimposition of these two maps will give a comprehensive picture of party competition, besides categorizing constituencies into one-party, two-party, three-party and multi-party regions.

(Jai Prakash Gupta)

B-3 : 2

SUDEEPTA ADHIKARI, *India's National Integration : A Problem in Political Geography, Geographical Review of India*, Vol. XLVII, No. 1, March, 1985, pp. 83-90.

In this paper an attempt has been made to analyse the geographical pattern of territorial function of the Indian federation towards achieving integration. It mainly deals with the geographical pattern of separation. Separation or centrifugalism tends to create disunity, and ultimately leads to disintegration. The geographical pattern of India's spatial growth reveals alternating periods of accession and merger of the erstwhile British Provinces and the Princely States with the Indian Dominion followed by several methods of coercion, and referendum which were also employed to achieve the territorial organisation. The geographical size of India itself creates 'distance problem' between the main geographical

heartland, and its peripheral areas, and for that matter the distance itself is a centrifugal factor. Because of its wide spatial extent, India is bestowed with physiographic, and climatic diversities that have largely impeded the process of functional relationship between the regions. India's geopolitical location has created instability in the geography of its heterogeneous federation. Major industrial activities are centred around a few metropolitan cities like Calcutta, Bombay, Madras and Delhi, and these industrial nodes appear as islands in the vast ocean of poverty.

The process of territorial integration of the country is yet to achieve positive results. The wide spatial extent of the country creates regional diversities. The presence of various communities on either side of the international frontier further accelerates the process of peripheral separation. Multinational character of the Indian society together with communalism, creates ethnic distance that largely interrupts the information flow. Linguistic diversities in regionally grouped areas have tended to weaken the national unity and integrity. Regional imbalances have also formed the geographical patterns of separatism, especially in the backward areas.

(Jai Prakash Gupta)

B-4 : 3

S.K. DISKHIT AND H.H. GIRI, A Review of Research In Electoral Geography, *Geographical Review of India*, Vol. XLVII, No. 4, June, 1985, pp. 13-21.

This paper is a review of research undertaken in the field of electoral geography. The history of the development of electoral geography dates back to the beginning of the 20th century, when it was first developed in France. Geographer's interest in the study of elections can be traced as early as the second decades of the present century, when Siegfried (1913) published his first work. The interest in electoral geography grew somewhat stronger after the World War II. The early sixties witnessed various valuable work and the electoral geography became one of the most developing branches of geography and made significant contributions to the study of political behaviour in the spatial context. The early seventies starts with the work of Brunn and Ingalls analyzing the voting trends in the towns of southern United States. Later, Brunn (1974) edited a collection of papers devoted to the current spatial patterns of political organisation in the United States and made an important contribution in electoral geography. Study of electoral geography in Indian Universities is of a very late origin, and

Amani (1970) is credited to have brought out the first work in the field, analysing the various aspects of Indian elections. Srivastava (1982) has unfolded several historical, social, regional, and local factors affecting the voting behaviour. His use of principle component analysis, trend surface analysis, correlation and regression analysis may provide useful guidelines to electoral geographers.

(Jai Prakash Gupta)

C - SOCIAL AND CULTURAL GEOGRAPHY

C-3 : 4

JANANI RAMACHANDRAN, Performance of an Innovation in the Warli Tribal Community -A critical Analysis of Agencies Involved and the Relative Influence of Factors Affecting Adoption Process, *Annals of National Association of Geographers, India*. Vol. V, No. 2, December, 1985, pp. 16-43, 7 Tables, 2 Diagrams.

In this paper an attempt has been made to study the technical innovations and their adoption by the Warlis—a tribal community in Thane district of Maharashtra. They practise subsistence agriculture with small-sized holdings and their methods of cultivation have been primitive. Family labour remains the chief input. Productivity of Warli farms has remained below the averages of Thane district. To realise greater productivity in Warli farms the government has introduced high yielding variety of paddy. Adoption of HYV comes with package of other innovations like controlled irrigation, application of chemical fertilizer, pesticides and careful farm management. The adoption analysis revealed that the geo-economic factors has been most influential. A linkage analysis based on 25 socio-economic factors reveals that economic and geographical factors like irrigation, cash crop cultivation, lowland acreage, distance of wage market, etc. , influenced adoption processes. Social and psychological factors appeared to play a secondary role in the adoption process.

(D. S. Sandhu)

C-4 : 5

M. ISHTIAQUE, Language Shifts Among the Tribal Communities : A Case Study of the Santhals, Mundas and Oraons in Bihar, *The Geographer* , Vol. XXXII, No. 2, 1985, 1 Map.

The scientific study of languages has attracted few geographers who have tried to explore the complexity of language diversity. Linguistic change is also an important aspect of the study of languages and the author has dealt with it in the tribal communities of Bihar. The author has tried to find out the nature of linguistic shifts among the Mundas, Santals and Oraons, the three major tribal groups of the Chotnagpur region to trace out areas of linguistic change, continuity and transition. It has also been tried to understand the factors and processes leading to language shifts.

The process of language shift varies from district to district depending upon the degree of interaction among the tribals. Physical, socio-economic and political factors are also important for language shifts. The shift is low in isolated and rural areas and high in urban areas. Besides, it is common among the literates and Christian tribals in comparison to illiterates and Hindu tribes. Mundas have undergone greater change than the Oraons and the Santhals.

(M. Farooq Siddiqui)

C-6 : 6

BISWAS, LINY, Religious Landscape and Hindu Temples of Calcutta, *Geographical Review of India* , Vol. XLVII, No. 1, March, 1985, 3 Maps, 1 Diagrams.

This paper is an attempt to understand the religious landscape and importance of Hindu temples of Calcutta. Architecturally the Hindu temples in Calcutta are not impressive; and most of them are very inconspicuous and many can hardly be distinguished from ordinary residential or commercial buildings. The distribution of early temples in Calcutta shows two distinct areas of concentration : one in North and another in South Calcutta. The geographical distribution of Hindu temples and shrines in Calcutta, their variety of forms, types, and locational characteristics provide valuable

insights into many important socio-cultural facts. This cultural-geographical investigation aims at locating major growth areas through historical periods, sketch the evolution of various types of religious landscape in the background of their changing cultural-historical context, and explain the resulting religious landscape and distributional pattern on the basis of three residential sectors. Urbanisation also brought commercialisation of temples. With an unprecedented rate of urbanisation during this century, the number of temples in Calcutta reached an all time high. A comparison of temples with the Hindu population of the city shows that temples have always increased alongwith the increase in population. A comparison of the distribution of temples and shrines with that of churches and mosques presents an interesting contrast. The business district is dominated by Churches. Hindu temples and shrines are either absent or very insignificant in number in the wards that have a large number of mosques. In general, wards with the least number of temples usually have a predominant non-Hindu population.

(Jai Prakash Gupta)

C-8 : 7

B. HYMA, AND A. RAMESH, Siddha System of Health Care - A Profile of users in Madras, *Transactions, Institute of Indian Geographers*, Vol. VII, No. 1, January, 1985, pp. 17-39, 5 Tables, 1 Map.

The paper presents the case of Siddha system of medicine indigenous to South India as a complementary service to other health care systems (Ayurveda, Unani, Homeopathy and modern medicine) prevalent in urban and rural areas of the state of Tamil Nadu. This system of medicine has received growing attention and support from the central, state and local governments in Tamil Nadu. The study analyses the intra-city consumer behaviour as determinants of the use of existing Siddha health facilities in the city of Madras. A questionnaire based survey of a sample of 500 out-patients attending 10 major Siddha clinics cum dispensaries in the city was conducted. Three major categories of clinics were selected - Madras city corporation, state governments and private clinics. Four major areas were investigated for clinic utilization pattern and consumer behavioural characteristics.

A brief review of the literature on the concepts of patient utilization of health services is first presented followed by a description of methods of data collection, information recording,

and the role of organizational and structural controls of the Siddha health services.

The results indicate that the political and economic settings greatly influence the organizational and locational aspects, mainly confined to heavily populated, old residential low income areas of the city. The majority of the people benefiting from the facility come from within a range of 3 kms, and they generally belong to low-income sections, and to the age-group 20-35 and 35-40.

Major attractive forces in the choice of Siddha treatment were found to be low cost treatment, expectations of long term care, nature of illness and diseases, belief in the system, previous knowledge and experience, effectiveness of treatment, familiarity, social contacts, its simplicity and ease of access. Facilities and service styles are found more suited to indigenous health care seeker's background. Patient's attitude towards Siddha services showed a general satisfaction. The Siddha health services are being expanded with government support.

(Jai Prakash Gupta)

C-8 : 8

R.P. MISHRA AND R.S. DUBE , Nutritional Level in a Rural Settlement of Madhy Pradesh, *Geographical Review of India*, Vol. XLVII, No. 1, March, 1985, pp. 47-51.

In this paper an attempt has been made to analyse the nutritional level in Semara Kachhi-a village of Sagar district, Madhya Pradesh. The pattern of household food consumption reveals that the people, especially those who belong to lower income groups are considerably malnourished. The villagers are predominantly vegetarian and their main diet consists of cereals and pulses. Daily diet is deficient in vegetables, fruits, milk, fats and animal proteins, particularly in the case of the people belonging to the lower socio-economic category. The diet of the people is highly deficient in carbohydrates, fat, calcium, vitamin A, vitamin B₂ (riboflavin), and vitamin C. On the other hand the consumption level of calories, proteins, iron, phosphorus, vitamin B₁ (Thiamin), and vitamin B₂ (niacin), is found to be quite satisfactory. Such inadequate diet has resulted in a wide range of nutritional deficiency diseases, such as night blindness, angular stomatitis, scurvy, dental decay and rickets. The study shows that the level of nutritional intake and the prevalence of deficiency diseases are strongly related in this village. The study also reveals that nutritional deficiency is closely

associated with the type of food production, dietary habits, and purchasing power of the individuals.

(Jai Prakash Gupta)

C-8 : 9

SHEELA PRASAD, The Incidence of Malaria in Major Urban Centres of Andhra Pradesh 1975-84, *Annals of the National Association of Geographers, India*, Vol.V, No.2, December, 1985, pp. 37-43, 3 Tables 3 Diagrams.

Among the diseases affecting the health of urban population, malaria probably is of prime importance, in terms of morbidity and number affected. Before the 1970's it was confined, mainly to certain rural areas, but since the resurgence the disease has spread to urban areas where it has emerged as a dominant health menace. The present paper attempts to throw light on the nature of the incidence of malaria in eight different urban centres of Andhra Pradesh. Over the last decade urban malaria is a function of *Anopheles Stephensi* which in turn is dependent on the number and increase in breeding sites available. The problem of malaria is more in coastal towns i. e. Vijayawada and Guntur. These towns are surrounded by zone of intensive wet agriculture, a factor that plays important role in the prevalence of Malaria. The phenomenal rise in the number of malaria cases in Vijayawada in 1984 may be attributed largely to the failure of the Malaria Control Organisation and Municipal authorities of the town. The increase in cases in Vishakapatnam in recent year is probably due to large scale development activity in the city as a result of which there has been a high influx of migrants into the city. Hyderabad, Vishakapatnam, Vijayawada and Guntur report the highest API rates. In these centres, population size is not the only cause of malaria, but other factors such as physical and social also play an important role. In the case of Vijayawada and Guntur, the moist climate continue to remain the cause of highest incidence of malaria. The seasonal pattern also emphasises the fact that months of heavy rainfall are followed by months of high incidence of malaria. A hypothesis have been formed based on the various stages of the city's growth and incidence of malaria.

(D. S. Sandhu)

C-8 : 10

SWAPNA BANERJEE - GUHA AND SMITA JOSHI, Health Facilities in Pune, *Geographical Review of India*, Vol. XLVII,

No. 4, December, 1985, pp. 50-55, 4 Tables, 1 Map, 1 Diagram.

An attempt has been made in this paper to analyse the patterns of distribution of health facilities in Pune district. The paper also attempts to bring out the levels of disparity in the distribution of health facilities at two levels : (i) in Pune metropolitan region and the remaining talukas of Pune district, and (ii) in Pune city and the other settlements within the Pune metropolitan region. The former brings out the disparity at a wider level, while the latter reveals the inter-urban disparity and the supremacy of the metropolitan core. As many as ten indicators have been selected to denote health care facilities. Pune is the second metropolis of western Maharashtra. It is situated at a distance of 192 kilometres from Bombay and has experienced industrial development only since the 'sixties'. Though the city has been overshadowed by the primacy of Bombay, it enjoys a privileged position compared to the rural surroundings in the location and allocation of facilities and services.

According to the range of each facility, subjective ranks have been attributed and hierarchy of health facilities found. Centrality of each facility has also been calculated to derive the functional hierarchy of the settlements enjoying different order of health facilities. It has been observed that in less developed countries such as India, the spatial distribution of health care services and the modern health-facilities tend to get highly centralised in urban areas. While eighty per cent of the Indian population lives in rural areas. Only 11 per cent of the physicians practise in rural areas.

(Jai Prakash Gupta)

C-9 : 11

MOONIS RAZA, AIJAZUDDIN AHMAD AND S. C. NUNA, Spatial Patterns of Tribal Literacy in India, *The Indian Geographical Journal*, Vol. LX, No. 2, December, 1985, pp. 103-116. 8 Tables.

The paper seeks to understand the situation of literacy among the Scheduled Tribes of India. It identifies the broad regional framework of tribal literacy. This paper also attempts to find out literacy inequality among the different components of tribal population by using the modified disparity index proposed by David E. Sopher. It is attempted to explain the present state of educational backwardness of the tribes by measuring the physical accessibility

to schools at different levels of schooling for the tribal population. This study is based on census data of 1981.

It has been found that the tribal literacy is quite low (16.35) in comparison to that in the case of general population. It is noted that the tribal districts with the highest literacy rates are confined to the North-East region. None of the tribal districts of mid-India region have high literacy. Between the urban- and rural components of the tribal population, higher literacy rates occurs in the urban areas. However, in the urban areas the tribal percentage is itself insignificant. There is also in equality between the males and females among the tribes in terms of literacy. This is evident from the fact that male have 22.84 per cent literates against 6.81 per cent among the tribal females. The areas where the women have been exposed to the outside influence in the wake of missionary activity the gap has been reduced considerably. Thus low level of inequality is found in the districts of Meghalaya Mizoram, Manipur, Nagaland and Lakshadweep.

In terms of accessibility to a schools, the tribal habitations are poorly served by the middle level school and the higher secondary schools are a rare facility to the tribes : only 13.31 per cent of the tribal population have middle school within their habitations. The secondary level schools are either not located in majority of the habitations or they are located at a distance which is not easily negotiable.

(O.P. Mandal)

C-9 : 12

NILADRI RANJAN DASH AND AIJAZDIN AHMAD, Tribal Literacy in India : Its Determinantes and Correlates, *The Geographer*, Vol. XXXII, No. 2, 1985 pp. 91-93.

Literacy in India is low with only about 36 per cent of her population classified as literate. Moreover tribals in the country are afflicted with high illiteracy. The authors have analysed the spatial patterns of tribal literacy and have attempted to unravel underlying causes of the backwardness of tribals in India. The spatial patterns of tribal literacy are studied in three sample regions representing 84 percent of total tribal population and comprising the States and Union Territories of Arunachal Pradesh, Assam, Manipur, Mayalaya, Mizoram, Nagaland and Tripura in the notheast; Bihar, Orissa and West Bengal in the east; and Gujarat, Madhya Pradesh and Maharashtra in the west.

With the help distribution data of various indicators for the censuses of 1961 and 1971 the authors have measured disparity between the tribal and the non-tribal components of the region and among the rural-urban and the male-female segments of the tribes. The progress in the field of literacy was measured through an analysis of the quantum of change during 1961-71. A set of demographic, economic and social indicators were utilized to identify the underlying causes of spatial variations in the level of tribal literacy.

The progress of literacy among the tribes during the intercensal period has varied from place to place and has been very slow. There is still a large illiterate segment of tribal population which has not shown any significant decline in their absolute number. Although no significant decline is noticeable in the level of disparity between the tribes and the non-tribal population, but the gap between the two segments of population appears to have reduced.

(M. Farooq Siddiqi)

C-9 : 13

PRABHA S. SHASTRI, Patterns of Tribal Literacy in Vidarbha, *Population Geography*, Vol. VII, No. 1 and 2, June-December, 1985, pp. 40-48.

This paper examines the spatial pattern of Tribal literacy in Vidarbha region in the eastern part of Maharashtra State. The study describes the distribution of tribal population and spatial pattern of their literacy. Urban-rural differentials between the scheduled caste and tribes has been measured. In India low level of literacy occurs among Scheduled Tribe population. The disparity between tribal (16.35 per cent) and total literacy (36.37 per cent) rate is more pronounced in regions where tribals constitute a large bulk of total population.

The tribal population accounts for about 15 per cent of the total population of Vidarbha, and is mostly concentrated in the eastern and southern parts of the state. The share of the tribal population at tehsil level ranges from 2.87 to 74.72 per cent. The tribes are predominantly rural in residential characteristics.

Literacy rate of 29.49 per cent among the tribes is significantly lower than the total literacy rate of 46.01 per cent. Tribal literates comprise less than 9.5 per cent of total literate

population of Vidharbha: the important factors for such low level of literacy are their poverty, use of different dialects other than the medium of instruction, and habitation in inaccessible areas in forests.

Spatial patterns of total and tribal literacy broadly correspond with each other. Tribal urban literacy (54.69 per cent) is much higher than Tribal rural literacy (25.47 per cent). Vidharbha has relatively higher level of urbanization (26.1 per cent) among the scheduled tribes (14.89 per cent).

The urban-rural differential in literacy is wider for the tribal (29.22 per cent) than for total population (22.10 per cent). Tribal male literacy rate (49.26 per cent) is more than double that of female literacy rate (17.65 per cent). Tribal female literacy in rural areas is extremely low (13.65 per cent).

The literacy rate among the scheduled caste population (40.15 per cent) is higher than among the tribal population rate (29.49 per cent) but lower than among the total population (46.01 per cent).

(R. L. Sharma)

C-9 : 14

UDAYA BHASKARA REDDY, Regional Disparities in Educational Development in India :An Inter-State Analysis, *Geographical Review of India*, Vol. XLVII, No. 2, June, 1985, pp. 22-27, 2 Tables 1 Map.

In this paper an attempt has been made to analyse the inter-state disparities in the levels of educational development, which is considered as one of the most important indices of development. A composite index of development has been arrived at using variables such as availability of educational facilities, number of students enrolled and percentage of literacy. Since the variables are not of equal importance, the relative importance of each has been taken care of by assigning weights accordingly. The overall educational development has been obtained by adding the indices of three functions and the states have been ranked depending on their respective scores. The inter-state disparities in educational development has been measured by using different criteria viz., facilities per lakh population, students enrolment per lakh population and literacy levels. The ranking of the states in terms of facilities per lakh population shows that north-eastern states occupied the first three ranks, while Uttar Pradesh, Rajasthan, and Tamil Nadu occupied the bottom three positions. The range of

composite indices varied from 77.08 in Rajasthan to the maximum of 172.18 in Nagaland. In other words, Nagaland is educationally the most advanced state followed by Manipur and Kerala, while Rajasthan and Uttar Pradesh are the most backward states. In order to remove the inter-state disparities, special efforts to promote enrolment among rural females, scheduled castes and scheduled tribes have been made. High priority should be given to elementary education of the weaker sections both in urban and rural areas.

(Jai Prakash Gupta)

C-11 : 15

K.M. KULKARNI, Levels of Crowding and Social Well-Being in Inter-Urban Environments, *Annals of the National Association of Geographers, India*, Vol. V, No. 2, December, 1985, pp. 44-49.

This paper is an attempt to understand the patterns of social well-being-social amenities, social security and social health in different levels of crowding conditions within the city of Ahmedabad.

After discussing the definition and types of crowding in brief, the paper reveals a close association among various indicators of crowding in the three ecological units of the city namely, the walled city, the eastern and the western urban zones of the city.

With the help of a set of four tables, the paper clearly shows that high density area of the walled city has better social amenities in terms of number, quality, and accessibility of per capita availability of water, milk, shops, offices, police stations, post-office number of lamp posts and so on. Whereas, the outer area of low density in the eastern and western parts of the city record low level of social amenities. The case of social security also shows the similar pattern, as high density area experiences crimes of less severe nature (e.g., gambling, black-marketing of cinema tickets), and thus, is relatively safe and secure from major crimes (e.g. murder, dacoity, robbery and house-breaking) which are highly prevalent in the low density areas.

Incidence of infectious diseases like jaundice, gastro-enteritis, diphtheria, measles, and chicken pox is very high in the moderate density area, followed by low and high density areas. Thus, density is not the main factor for the intensity of the incidence of infectious diseases, it is the quality of physical and social environments.

(K.N. Prasad)

C-12 : 16

ARCHANA R. DHOLAKIA. Role of Social infracruture in Reducing real Regional - Disparities, *Indian Journal of Regional Science*, Vol. XVII, No. 1, 1985, pp. 76-81.

The present paper is an attempt to construct a welfare matrix in order to obtain the differentials in the levels of regional development. The paper is divided into five sections. Section II outlines a model for derving last testable hypothesis about determinants of welfare levels in different states. Section III is devoted to measurement of different varification of the model for empirical varification. In section IV an empirical varification of the model has been carried out with the help of data pertaining to fifteen major states in India for the year 1971. Finally a discussion on policy implications has been presented in the last sections.

In order to evaluate the quality of life of population, it is the social infrastructure which should get top priority in our planned efforts. The paper, however, remains inconclusive as far as determination of the priorities between agriculture and industry is concerned.

(Sudhir Malakar)

C-13 : 17

RAVINDRA H. DHOLAKIA AND PREM J. M. PATEL, Interregional Variation in the Access of Females to Working-force in India, 1981, *Indian Journal of Regional Science*, Vol XVII, No. 2, 1985, pp. 62-68.

In the present paper, an attempt has been made to examine the interregional varitation in the proportion of females in the total working population in India during the year 1981. The exercise carried out is expected to provide interesting insight into the nature of labour markets and some structural forces operative in various economics in India . The paper analyses the variation in the female participation rate (FPR) by indentifying employment structures, literacy rates and nature of technology relevant for literate and illiterate workers.

The study implies that sex-discriminating aspects of rural technology in general and in agriculture sector in particular are the major determinats of interstate variation in the access of females to the working force, and hence in their relative

contribution to the state domestic product. The technology mix relevant for the rural and urban workers and self discriminating aspects of technology relevant for urban workers are not the major factors determining the interstate variations. Although the industrial structure varies considerably across the country, the rural technology in agricultural sector in the initial stages of economic development is expected to go against females who constitute marginal categories in the rural working force.

(Sudhir Malakar)

D-ECONOMIC GEOGRAPHY

D-3 : 18

SEVATI MITRA AND SUPROVA RAY, Changing Occupational Structure in Darjeeling Hills, *Geographical Review of India*, Vol. XLVII, No. 2 June, 1985, pp. 61-67.

The authors of this paper have attempted to analyse the patterns of the changing occupational structure in the hill division of Darjeeling district for a period of 20 years, from 1961 to 1981. The area chosen for enquiry has been delineated as a district and homogenous cultural region. The study reveals a shift of workers away from cultivation. Since the 4th Five Year Plan several measures have been undertaken by the government to improve the conditions of cultivators. Other opportunities extended by rural development projects have started attracting workers to household industry, which is on the rise, though slowly. It seems that the plans are yet to show results. The distribution of development measures over the hill division of Darjeeling and a weak administrative system have been a problem for a balanced growth of the economy. In some areas local resource development has not been at par with the development of transportation, and in others the reverse has taken place. This mountain territory of Darjeeling is ideal for development of tourism and cottage industries. The ecological balance is delicate in this area of great physical constraints. Cultivated land cannot be extended at the cost of the destruction of slopes. The shift of occupation towards household industry is a good sign. Wherever other opportunities are made available, there is a distinct decrease in the population engaged in cultivation.

(Jai Prakash Gupta)

D-4 : 19

HIFZUR REHMAN, Trends in Energy Consumption in India, *The Geographer*, Vol. XXXII, No. 1, January, 1985, pp. 36-51.

In this paper an attempt has been made to evaluate the energy resources available, the trends of their consumption and prospects of future development in India. Energy consumption is an indicator of national wealth, and the level and pattern of its utilization is an index of industrial development and standards of living of the people. The energy consumed in India consists of a variety of forms ranging from electricity obtained from nuclear fuels to agricultural waste and animal refuse. The sources of energy are grouped into five broad categories, viz.; coal, oil and natural gas, hydro-electricity, and nuclear fuels, referred to as 'commercial energy' while the fifth category is 'non-commercial energy' obtained from fuelwood, agricultural waste and animal dung. The most important among non-commercial energy is the forest resource, which provides the basis of fuelwood and charcoal.

Coal, oil, natural gas, hydro-electric resources, nuclear fuels-uranium and thorium, agricultural waste and animal refuse and forest resources have been discussed as they are used as energy resources in India. The trends of energy supplies and consumption have also been highlighted. The level of energy consumption in the rural as well as urban areas show a striking contrast in terms of proportion of energy consumed from different sources. In rural areas a major proportion of the energy consumed belong to the non-commercial sources while in the urban areas share of commercial use of energy is higher. Due to heavy demand of energy, the new and renewable sources of energy such as solar, wind, biogas, hydro, geothermal, tidal power have, therefore, acquired greater importance under present circumstances. With the future course of development, these aspects of renewable energy can contribute much of the demand of energy for the existing and future population of India.

(Jai Prakash Gupta)

D-7 : 20

INDU PATNAIK, Changes in the Distributional Pattern of Workers in Manufacturing in India : 1901-1971, *Population*

Geography, Vol. VII, No. 1 and 2, June-December, 1985, pp. 18-26, 3 Tables, 4 Maps.

The purpose of this study is to obtain an objective spatio-temporal picture of industrialisation in India during the present century. Economic progress and industrial development are closely linked. The relative share of workers in manufacturing both household and non-household, in India has remained almost static since the beginning of the present century.

Industrialisation and manufacturing in India got localized in the port cities resulting in enclave development. The study emphasises that the location and spread of industries was contingent not only on the distribution of resources but also on the prevailing politico-economic milieu in the country.

In 1901, manufacturing employed about 7.5 million male workers, that is 9.7 per cent of the total workforce. The study revealed that the share of manufacturing workers in the year 1931, not only fell to a meagre eight per cent, but there were significant changes in their spatial distribution also. There was a change in the structure of manufacturing sector and also an expansion of some consumer oriented industries. Data for 1971 and its analysis reveal a persistence of the colonial spatial pattern of manufacturing although significant increase in workers in manufacturing sectors has taken place.

In conclusion a comparative analysis and district-wise distribution of male workers engaged in manufacturing shows increase in manufacturing workers. It is, however, evident from the analysis that no employment has been provided to the rapidly increasing labour force in the country, and share of workforce engaged in manufacturing did not change.

The analysis of male workers in manufacturing reveals that industrial activities during 1901-1971 remained not only insignificant but the spatial pattern of manufacturing persisted. In 1971, four metropolitan centres expanded to form regions of industrial progress.

(R. L. Sharma)

E-AGRICULTURAL GEOGRAPHY

E-1 : 21

M. SAMBASIVA RAO, Land Suitability of the Madurai District Using Remote Sensing Data : *The Geographer*, Vol. XXXII, No. 1, January, 1985, pp. 81-92, 1 Tables, 12 Maps.

In this paper an attempt has been made to delineate and identify various water sheds, landforms, soils, land-use, and hydro-geomorphic units of Madurai district with the help of Landsats, FCC'S and Survey of India topographic sheets. The various landforms identified are classified into denudational, fluvial and aeolian based on the major geomorphic processes involved in their formation. Based on irrigation, cropping-pattern, and physical attributes namely watersheds, slope, landforms, lithology, soils, landuse, and hydromorphic units, the land suitability of agricultural use are identified. It is recommended that proper measures have to be taken in the areas where extraction of water is exceeding the actual group water potential. The extraction is minimum in areas where water is provided by canal irrigation.

To increase the productivity, efficient water management and improved agricultural practices including adaptation of high yielding varieties, manures, fertilizers and pesticides are suggested. Rural industries may be encouraged alongwith dairy farming, livestock and poultry development in rural areas.

(Jai Prakash Gupta)

E-2 : 22

M. FAROOQ SIDDIQUI, Spatio-temporal Changes in Crop Associations in Bundelkhand (U.P.), India, *The Geographer*, Vol. XXXII, No. 1, January, 1985, pp. 65-80, 4 Tables, 3 Maps.

An attempt has been made in the paper to analyse the spatio-temporal changes in crop associations in Bundelkhand region, Uttar Pradesh. Type of crops grown in any region are a result of an interplay of physical, socio-economic, cultural and technological factors. In the present study only statistically significant crops are taken into consideration to study spatio-temporal changes. The relative strength of crops was ascertained by calculating their percentages and then these percentages were arranged in

descending order and leading crop associations were formed by consulting the one-sheet table of critical values provided by Doi (1970). Eleven crops were included during the period from 1964-47 to 1950-51 to obtain seven crop-association regions. The areas of high specialization where three crops had the full sway were wide stretches to the east and west of the gram and wheat areas. Areas of medium specialization were generally found in the northern parts of the region where four or five crops were included in the combination.

In contrast the pattern of crops evolved lately after a gap of thirty years are very simple with less diversity of crops. There are only eight crops which were statistically important during the period from 1976-77 to 1980-81. Five crop association regions were plotted on a map. The comparison reveals a remarkable change in the cropping pattern. There is an apparent shift from diversified cropping of pure subsistence type to specialized cropping of semi-subsistence type. The change has been brought about by an assured water supply, implementation of Intensive Area Development Programmes, HYV and an obvious change in the socio-economic attitude of the cultivator and the consumer. Crop associations have also undergone a change from greater diversification to a high degree of specialization. This study points to an increasing tendency of greater specialization in the cropping patterns by the farmer resorting to selection of only a few crops covering a major portion of the total harvested area.

(Jai Prakash Gupta)

E-2 : 23

R. MOHAN AND R.P. GUPTA, Land Use Classification of the Area Around Jaipur, Using Landsat Data, *The National Geographical Journal of India*, Vol. XXXI, No. 1, 1985, pp. 39-43, 1 Table, 2 Maps.

In the present study, an attempt has been made to assess the feasibility of using landsat data for land-use studies around Jaipur.

After briefing on the importance of maps in landuse, planning, especially for urban development (where human and industrial activities are marked.), Landsat data and topographical sheets of the Survey of India have been utilised in order to identify some of the features around Jaipur, these are water bodies, sand cover, rock slopes (without vegetation), urban area and sub-urban area. Three kinds of water bodies have been marked:

ponds with dense vegetation, ponds without vegetation and ponds with sparse vegetation.

Classification algorithm has been worked out by developing a programme called MINDIS. Mean deviation and standard deviation is also used for the computer mapping of these classifications. The features in the computer generally correspond with the features on the ground maps. Both the maps show similarity in distribution of water bodies, urban and sub-areas, rock slopes have been misclassified as urban area. Similarly dominantly sub-urban areas in the north-eastern part is shown as urban class by the computer mapping. This implies that there has been rapid urbanization activities in recent times, in this part.

(K. N. Prasad)

E-2 : 24

S.C. SHARMA, Post-Consolidation Changes in the Use of Land in Balrampur Pargana (Uttar Pradesh), *Geographical Review of India*, Vol. XLVII, No. 3, September, 1985, pp. 73-84, 4 Tables.

This paper is an attempt to evaluate the impact of consolidation on land utilization of two villages namely Jumali Kalan and Bagahi of Balrampur Pargana in Gonda district, Uttar Pradesh. The study reveals that the holdings are now more compact with bigger plots in place of the previously small and scattered holdings. The number of plots has decreased, and a better field pattern has been achieved. Certain very important and remarkable changes have taken place in the general and agricultural use of land in these villages. Area under *abadi* (settlement) and paths and chak roads has increased, and the proportion of culturable wasteland has recorded a decline and significant increase has been observed in the double cropped and irrigated areas. The acreage of paddy and wheat has increased. There has been a tendency for increased use of fertilizer and high yielding varieties of seeds. The per hector yield of crops, as a result, has increased substantially.

In the absence of adequate facilities for more intensive irrigation, the main purpose of the consolidation of holdings has not been fully realized. It has been observed in Jumali Kalan village that the farmers are not getting all the benefits which this

change could have brought about mainly due to lack of irrigational facilities. A small tenure holders cannot afford a tubewell or pumping set for their size of holdings. Public tubewell and other means of irrigation should be available for small farmers if the gains of consolidation is to be fully realised. Nevertheless, the changes, which have taken place in the agricultural economy of these villages are impressive.

The author, however has chosen to remain silent on the about the impact consolidation has on the pattern of distribution of holdings among the landless.

(Jai Prakash Gupta)

E-3 : 25

ALI MOHAMMAD AND K.Z. AMANI, Regional Imbalances in Yield and Growth Levels of Rice Production in India, *The Geographer*, Vol. XXXII, No. 2, 1985, pp. 56-68, 5 Tables, 4 Maps.

Rice production has increased three to four-fold from 1950 to 1984. The authors have measured and analysed its growth in area, production and yield of crop in India for two periods of three year duration each i.e. 1960 to 1971 and 1976 to 1979.

The analysis indicates considerable variations in the growth of area, yield and production of rice from state to state. The increase has been achieved owing to increased irrigation facilities and the adoption of high yielding varieties which give greater yield as compared to other cereal crops of the kharif season.

The district level data has been used to demarcate yield level and growth regions. The regional picture emerging out from district level analysis is different from that of the state level. The locational picture is more reliable in micro level analysis.

The production of rice as pointed out by the authors is not sufficient to meet the demand and therefore special efforts are required to increase the production. The district level analysis has identified priority regions which need special attention. In order to improve the situation in different yield categories, an evaluation of present level of inputs and other facilities is required for individual regions separately while chalking out any strategy for development.

(M. Farooq Siddiqui)

E-3 : 26

M. SHAFI, Perspectives on Agricultural Development in Tribal Areas with special reference to Chhotanagpur Plateau, *The Geographer*. Vol. XXXII, No. 2, 1985, pp. 6-12.

India has a substantial tribal population of which a little less than half is concentrated in the eight states of the north-eastern India. The development of tribal areas calls for an integrated programme of agricultural development embracing crop production, horticulture, animal husbandry and forestry. The author suggests that the integrated programme should go hand in hand with infrastructural facilities in the spheres of minor irrigation, drainage, soil conservation and such processes of post-harvest technology as storage, processing, transport, marketing and distribution. The problem of agricultural development in tribal areas is analysed with Chhotanagpur plateau as a case.

Chhotanagpur plateau, owing to large barren and uncultivated land, has a low per capita land available for cultivation. The extension of cultivation over marginal lands has led to extensive deforestation; low productivity and soil erosion. Effective land management measures are required to improve the yield levels and the income of the farmer. A balanced solution in view of the other lies in utilising highlying areas for afforestation, grassland and pasture development and the lower slopes for horticulture and plantation crops.

Shifting cultivation in tribal areas need special management so as to limit its disadvantages and promote the fertility of soil. It is also important that forest based industries be located in tribal areas for the diversification of employment opportunities. Rice, the main crop of tribal agriculture calls for special attention so that the agronomic practices are kept in tune with the local rainfall rhythm.

Tribal agriculture suffer from poor marketing, transport and storage facilities. The author has suggested the provision of improved storage structure and preservation facilities, holding of local markets everyday within a radius of five kilometres from the village and processing of agricultural products for sale in order to remove the handicaps of tribal agriculture.

The recommendation of the National Commission on Indian Agriculture for the establishment a Central Laboratory for industrial utilization of agricultural products of Chhotanagpur shall be of great value to tribal population.

(M. Farooq Siddiqi)

E-3 : 27

T. C. SHARMA AND O. C. COUTINHO, Disparities in Food-grains Production in Uttar Pradesh : A Spatio-Temporal Analysis, *Transactions, Institute of Indian Geographers*, Vol. VII, No. 1, January, 1985, pp. 67-71.

In this paper, attempts have been made to analyse empirically the growth of foodgrain production since 1966-67, to decompose the components of production increase between 1966-67 and 1980-81, to measure the yield variation over time and space, to measure the yield gap between the various levels of practices, and to correlate the gap with certain well-known factors for 1980-81 in the state of Uttar Pradesh to focus on the yield disparity and potential available in this state.

The study carried out with the objectives of analysing the spatial patterns of the growth, and the disparities resulting therefrom in the production of foodgrains in the state of Uttar Pradesh in the recent years, reveals that most of the increment to foodgrains production has come from the rise in the yield of cereals in the western districts. The disparity in the yields is much greater now than in the past and irrigation is the most important factor responsible for it. The author argues in favour of expanding the irrigation base in the southern and eastern districts and tap the area unrealised potential for agricultural production.

Multiple regression technique has been used to measure the factors responsible for the existing yield-gap by taking the index of potential realisation as the dependent variable. The spatial patterns of growth within the region are also explainable in terms of the increase in yield which in turn is linked closely to increase in irrigation. Though the yield rates in foodgrains registered an increase in all the districts, the growth was highly uneven and , as a result, inter-district variation has been quite large.

The study reveals that almost the entire increase in foodgrains production took place due to rise in the yields of cereals. Irrigation emerges as the most important factor affecting the yields patterns. The study shows that unless the yields improve, pulses will be eliminated from the state's cropping patterns in the years to come.

(Jai Prakash Gupta)

E-3 : 28

T. S. CHOUHAN, Agricultural and Livestock Development in Western Rajasthan : A Case Study of the Malani Region, *The Indian Journal of Geography*, Vol. XIV, 1984-85, pp. 68-78, 4 Tables, 1 Diagram.

In this paper, an attempt, has been made to evaluate the situation of agriculture and livestock raising in western Rajasthan Malani Region has been chosen for the case study. The Malani region is a vast desert where frequent drought cause decline in net area sown and the also in the population of livestock in the region. Less than one per cent area is a under the double crop which suggest that entire area is dependent upon kharif season and subject to the vagaries of monsoon. Main crop of the region is bajra. Only 4 per cent of the gross cropped area is irrigated . The sheeps and the goats constitute the major livestock, followed by the cows. This suggest that in the drought affected area the low level of income and inadequate marketing and water facilities compell the breeders to rear sheeps and goats. During 1966-72 there was an overall decline of livestock by 4 per cent per annum. In the same period the population of buffaloes decreased by 12 per cent annually. This loss of the buffalo population was due to the recurrence of drought in the area.

(O.P. Mandal)

E-3 : 29

V. VIDYANATH, Crop Productivity in Relation to Cropland in Andhra Pradesh-A Spatial Analysis. *Transactions, Institute of Indian Geographers*. Vol. VII No. 1, January 1985 PP. 49-55 2 Tables.

In this paper, an attempt has been made to analyse the patterns of crop productivity in Andhra Pradesh. Agricultural productivity is used as the most important indicator to depict the spatial pattern of agricultural development of any area. Crop productivity is a function of several variables pertaining to physical, socio-economic, technical and organisational aspects. Besides, it is also frequently associated with attitudes towards work, thrift, industriousness and aspirations for higher learning.

The author adopted a different method to find out the degree of relationship between cropland and crop productivity in Andhra Pradesh at district level. Normally, crop production should proportionately increase with cropland area. If the rate of increase in crop production is higher than the rate of increase in cropland the crop productivity is said to be higher and vice-verse. If the rate of increase in crop production is more or less equal to the cropland area the productivity is considered to be normal.

The ratio index between production share of crops, and cropland area share has been worked out at the district level. Very high crop production cropland ratio index values are found in the coastal districts-Visakhapatnam, East Godavari, West Godavari and Nizamabad districts. This high productivity is due to high fertility of alluvial and red soils, intensive cultivation and assured water supply due to canal irrigation. Krishna, Chittoor and Madak districts show high crop productivity. Eight districts namely Srikakulam, Vijainagaram, Guntur, Nellore, Cuddapah, Karimnagar, Warangal and Rangareddy show medium-crop productivity. Cuddapah and Ananthapur districts get very low rainfall and hence become drought-prone areas.

The spatial pattern of crop production in relation to crop land area in Andhra Pradesh is found to be largely influenced by soil fertility, rainfall and irrigation. Low soil fertility is another important contributing factor. Low crop productivity is noticed in the remaining districts except Adilabad and Prakasam.

(Jai Prakash Gupta)

E-9 : 30

VIJAY KUMAR AND MOHINDER PAL, Development of Irrigation in Haryana : Limitations And Prospects-A Review, *Transactions of the Institute of Indian Geographers*, Vol VII No. 2, July 1985.

This paper provides an account of the state of irrigation in Haryana and its role and importance in the impressive gains in agricultural growth and development. Irrigation is an important aspect in Haryana's agriculture. Availability of improved variety and sophisticated irrigation network has contributed significantly to the breakthrough in agriculture. Due to large-scale expansion in irrigation, the state has made a remarkable shift away from

substance agricultural stage to semi-commercial. In 1966-67, irrigational facilities were made available to only 13.25 lakh hectares of agricultural land which increased to 22.48 lakhs hectares in 1981-82. The factors associated with this improved agricultural situation in the state are not only the development in irrigation facilities but also a considerable development in transport and large-scale reclamation of uncultivable land.

The semi-arid conditions in Haryana together with uncertainties of rainfall in both its volume and time requires an efficient irrigation network. It is in the interest of the state that sizeable resources should be invested for providing irrigation to its arid regions. Without artificial irrigation, agriculture in Haryana is a gamble. It is an important constituent of the current strategy for raising agricultural production. It has become more important in the light of an increasing pressure of population and unfavourable climatic conditions. Due to limited cropped area, greater reliance has to be placed on irrigation so as to promote multiple cropping.

(Jai Prakash Gupta)

E-9 : 31

FALGUMI CHAKRABORTY, Making of Plough : A Case study of Natural Adaptation of Technology among the Santhals. *Man in India* Vol XLV, No. 3 September 1985. PP. 246-260.

The paper demonstrates how the craft of plough making is conditioned by the local hill forest ecology, and to that extent the different processes of plough-making are guided by principles of rational and economic use of natural resources and labour power. The findings have been brought out after an intensive survey and minute observation by the author during her six months stay in the village Puniasasan. Such a technology of plough making may not be oriented in terms of size of raising the level of production, or profit beyond a limited scale. But it operates in terms of optimum utilisation of raw materials through proper co-ordination of labour and energy. Cultivation is the primary occupation of Puniasasan.

The Santals of Puniasasan significantly depend upon the forest for fuel, leaf cups and plates, tooth lwiws, seasonal fruits, for collecting or hunting edible insects. They also use the wood collected from the forest for building their huts, making agricultural implements and parts of bullock carts.

The author apart from describing the plough making also talks about the types of plough that the Santals make. The different

methods of making plough adopted by the tribals are also discussed in the paper. The technique of plough making varies with the size of the log. Finally on the basis of field observation the paper throws light on the economic behaviour of the tribals.

(Sudhir Malakar)

E-9 : 32

K. Z. AMANI, Impact of Technology on Rural Habitat Transformation in Aligarh District, Uttar Pradesh (India)
The Geographer Vol. XXXII PP. 7-13.

In this paper an attempt has been made to assess the impact of technology on rural habitat transformation in Aligarh district. The district of Aligarh is located in a well-drained and productive part of the Upper Ganga Plain. About 2 million population in the district residing in 1,749 villages are predominantly agricultural. Only about 5 per cent of the workforce is engaged in traditional crafts. The study area receives an average annual rainfall of 663 mm most of which is received during the rainy months.

In order to assess the nature and extent of transformation overtaking the countryside, a survey was conducted to find out the nature and direction of change brought about as a result of the introduction of science and technology in the development of agriculture and its effects on the habitat. The most remarkable change has been the substantial increase in agricultural production made possible by better irrigation, application of chemical fertilizers, HYV of seeds etc., These new impacts are the products of research and technological changes in the technological know-how taking place in the country as a whole. During a span of 15 years there has been considerable increase as regards the use of modern farm implements. Thus, increased use of modern farm implements are indicative of the increasing awareness among the cultivators in the adoption of new technology for agricultural development.

The present survey of the role of technology in rural habitat transformation indicates that there has been a change for the better and technology has been able to influence the rural population in many ways.

(Jai Prakash Gupta)

F-INDUSTRIAL GEOGRAPHY

F-2 : 33

(Mrs) SWARANJIT MEHTA AND SANJEEV SHARMA
Locational Conflicts in Small Town : A Case Study of A Co-operative Sugar Mill in Punjab, *The Indian Geographical Journal*. Vol. LX, No. 1, June 1985 PP 24-29.

The present paper deals with the locational conflict for setting up a small agro-based factory at Nawasahr, a taluk headquarter in the district of Jalandhar in central Punjab. The conflict resolved around choosing a site for a co-operative sugar mill. The controvercies regarding the selection of a particular site for a specific purpose may be defined as a locational conflict.

In the critical stage inter-town rivalry cropped up, suggestions and counter claims were presented by the various interest groups, technicians, administrators, leaders, and the members of the boards of directors of the co-operative society. Each proposal had its merit and limitations. Ultimately opinion in the favour of the location at Nawashahr mustered maximum support because of the co-operative society having been registered in this town and because the influencial persons of the society belonged to the town.

The reason for the involvement of the people at the individual or group level in such a conflict is an attempt to secure economic, political and social benefits. It has been oberserved that the final decision comes from the descision-making authority. More often than not the final descision is found to be in favour of the most powerful and influential groups.

(O.P. Madal)

G-GEOGRAPHY OF MARKETING, TRANSPORT AND COMMUNICATIONS

G-2 : 34

B. G. TAMASKAR, Stability of Periodic Market-Places and Marketing System in the Arvi Upland, *The Deccan Geographer*, Vol. XXIII No. 1 Jan-June, 1985 PP. 55-70

In this paper an attempt has been made to understand the causes and consequences of normality, essential conditions for healthy growth, and, attributes of longevity of Periodic Market places and Marketing System. The stability of new-born Periodic Market places depend mostly on healthy, stimulating, and positively conducive socio-economic variables such as the needs of participants, the proper and effective organisation of space and time, comparative advantages, and other allied conditions. The existence of Periodic Market places bears an intimate relationship with the needs of the society and does not just stem from exchange of goods and availability of services and their periodicity is partly determined by social institutions. Favourable and beneficent policy decisions and positive incentives can only infuse vigour and stability of Periodic Marketing System. This Periodic Marketing System exhibits stability as a consequence of its being basic social as well as economic unit. There is a general upward trend in the number of Periodic Market places, in spite of the development of roads and increase in quick transport amenities, facilitating frequent contacts of rural population with large, permanent market centres. Service areas of Periodic Market Places, once viable in conditions of lower mobility or greater demand density may be captured by large, more vigorous market places, leaving little economic incentive to traders or buyers to continue to visit smaller periodic market places.

(Jai Prakash Gupta)

G-3 : 35

B. ARUNACHALM, *The Heaven Finding Art in Indian Navigational Traditions Annals of the National Association of Geographers, India*, Vol. V, No. 1, June, 1985, PP. 1-23.

Though a plentiful literature exists on commercial relations of Indians with other parts of the world in the centuries bygone, little attention has been paid by scholars to the Indian knowledge of navigational relevance. This study is based on references to literature, maps, and personal interviews with members of maritime community. The author examines: (a) the traditions prevalent and practised by people on the Indian shores, as far as direction finding and hump line sailing are concerned; and (b) explains how this knowledge was used in constructing navigational charts or maps for their own use as well as for their future generations. It is believed that sailing with the mariner's compass developed only

around 1300 A.D. in the Mediterranean world and about the same time, the Arabs and the Hindus also knew about it, though they did not make much use of it. Different Indian traditions exist in different sections of the Indian shores : some are entirely based on winds and the areas/regions to which they belong some are based on stellar constellations, borrowed from the Arab world; and some more are based on a curious mixture of stars, the sun and the winds : the charts rehamanis, and roz-mamas available among the Indian sea-men are still in practise as in the olden ways. These are in different languages. These traditional manuscripts available with Indian sailors may be entirely lost, if no effort is made to retain them.

(D. S. Sandhu)

G-7 : 36

INDRAJIT RAY, Water Transport versus Air Transport between Andaman & Nicobar Islands and Mainland : An Evaluation of Social Costs and Benefits, *Indian Journal of Regional Science*, Vol. XVII, No. 1, 1985, PP. 51-64.

This study emanates from a controversy in the Andaman and Nicobar (A & N) Administration as to the relative viability of water and air transportation between A & N island and mainland. In the present system, the Shipping Corporation of India is allowed to claim a subsidy to the extent of 80 per cent of overall losses from A & N Administration in plying passenger-cum-cargo vessels on these routes.

The cost-benefit analysis shows that from the viewpoint of social benefit-cost ratio, the water transportation are relatively more viable modes of transportation in comparison to air transport.

The present study reveals that the air transport is relatively inefficient than shipping transport. But author is of opinion that the former mode of transport should not be abandoned. The present study also highlights that the service of passenger-cum-cargo vessels earns higher net social benefits than the service of air crafts and hence, any attempt to abandon the shipping service would call upon a lower rate of material development in the country in general and in A & N islands in particular. The paper suggests that fare revision of both shipping and air transport should be allowed to the extent of the international competitive rates and the movement of different goods and passengers should be subsidised directly instead in line with the objectives and strategies of development in these islands.

(Sudhir Malabar)

G-7 : 37

P. K. DĀS AND B.N. SINHA Inter-city Airway Connectivity in India, *Geographical Review of India*, Vol. XLVII, No. 3, Sept. 1985, PP. 25-29.

The paper attempts to analyse the spatial aspects of air transport in India during 1975-76. Spatial structure of the network of air routes gives the pattern of spatial association of the nodes in a nodal hierarchy. In a nodal hierarchy described by a network of points and lines, the points represent central places and lines represent the functional association between dominant and subordinate centres. The most suitable method to study the spatial structure of the network is the application of multiple factor analysis on the binary connectivity matrix. Multiple factor analysis gives rise to matrices of factor loads and factor scores. Five nodal regions centring round Bombay, Delhi, Calcutta, Madras and Gauhati have been indicated by the authors. The overall picture remains that the four metropolitan centres are major nodes in determining the spatial structure of the airway connectivity. The analysis of the structure of flow involves the identification of generic locational characteristics of groups of origins or groups of destinations. By the application of R-mode factor analysis the groups of destinations and the corresponding dominant shipper for each group are determined. The comparison of the two schemes of functional regions, based on the similarity in origin and similarity in destination, reveals that the areal extension of spatial interactions, measured in terms of to and for movements of passengers is almost same all over India except in the case of the northern belt. The pattern of inward journey in north India is different from that of outward journey. Comparison with the spatial structure of network reveals that the structural orientation of airway connectivity in India is based on the areal extent of terminating traffic rather than on originating traffic.

(Jai Prakash Gupta)

H-POPULATION GEOGRAPHY

H-1 :38

KRISHNA KUMAR, Disabled Population in India, 1981 : A Spatial View, *Population Geography*, Vol. VII, Nos. 1 & 2, June-December, 1985, PP. 60-65.

The paper deals with the disabled population in India, 1981, such as the blind, deaf and orthopaedically handicapped. The population of the disabled persons in India was about 1.12 million in 1981, which accounted for about 0.17 per cent of the total population. The blind shares 42.78 per cent, the crippled 32.49 per cent, and the dumb 24.73 per cent of the total disabled population in India. The rural and the urban areas have 86.63 and 13.37 per cent of the total disabled population respectively.

There are considerable spatial variations in terms of the relative dominance of the various types of disabled population. Districts claiming highest portion of the blind among the disabled made 63.18 per cent of the total number of districts and covered 71.79 per cent of the area. Dominance of the crippled and the districts falling in these zones made 20.40 per cent of the total and covered 16.07 per cent of the area. The dumb-dominated zones made 16.42 per cent of the total districts and covered 12.14 per cent of the areas. Incidence of disability was found to be higher in the northern, north eastern and central part of the country.

On the basis of the distribution pattern of the disabled population the disability regions were marked and explained. There were 1.71 disabled persons for every 1000 persons in the country. The ratio of the disabled persons ranged from 0.45 in Greater Bombay to 8.78 in south Sikkim.

All these facts provide only a general demographic profile of the disabled population in India and touch only limited dimensions of its spread. However, the above profile is likely to give some clues to the further comprehension and evaluation of the situation for formulating equisite schemes and policies for the welfare of the disabled.

(R. L. Sharma)

H-3 : 39

J. P. SINGH The Changing Household Structures in Bihar, Kerala and West Bengal : A Comparative Overview. *Demography India*, Vol. XIV, No. 1, Jan-June 1985, PP. 34-48.

This paper seeks to examine the changing size and composition of households with special reference to Bihar, Kerala and West Bengal. It is indicated that during the last three decades the average size of households has increased. During the same period the fertility level in the country has been at its maximum. The change

in the size of household is thus related mainly to the decline in mortality rates. Increase in the age at marriage is also relevant since it results in pushing up the duration of stay of unmarried persons in the family of origin.

The average urban household is somewhat smaller in Bihar, West Bengal and the rest of the country except Kerala. This is related to (i) a greater proportion of single member households, and (ii) a smaller proportion of dependents to household heads.

Males continue to be formal heads of households in India. The prevalence of materiarchal-matrilineal type of family, a relatively higher expectancy of life for women and spinsterhood largely account for a high proportion of female household heads in Kerala.

(K. D. Sharma)

H-5 : 40

M.D. ATAULLAH AND V.N.P. SINHA The Social Ecology of Migrants in Patna *Geographical Review of India*, Vol. XLVII, No. 1, March 1985, PP. 74-82

Based on primary investigation of selected migrant families, the study analyses the socio-ecological conditions of the migrants in Patna city. In this study only five hundred migrant families comprising 2,030 members of different socio-economic strata have been interviewed and their places of origin, socio-economic conditions, social interaction, social transformation, demographic and cultural attributes, etc. have been analysed. Significant contrast has been observed among migrants coming from districts other than Patna and other states. In the case of migrants coming from Patna district itself the ratio of male and female remains 16 and 15 per cent respectively. Even among the migrants coming from other states the share of males and females are 8 and 3 per cent respectively. The uneven share of male and female migrants is also evident among the foreigners having 1.28 and 0.72 per cent respectively. As regards spatial distribution of migrants in the urban areas of Patna, it is important to note that migrants engaged in different occupations have been attracted by different areas specialised in different urban functions. The analysis of literacy according to the place of origin shows that 26.59 per cent of the total migrants coming from the same district are literate. Migration plays a dominant role in transforming social life of human beings and cultural environment of both the places. The test of the hypothesis concerning adoption of new cultural traits shows that most of the migrants have preferred to maintain their traditional

social behaviour and religions beliefs for a long period. Migrants belonging higher social strata having higher educational levels are found developing wider social network and adopting new social customs and behaviour easily. Uniform spatial distribution has been given due consideration, but it has also been tried to select families from different socio-economic hierarchial orders having diversities in ethnic composition, economic status, educational levels and socio-political awareness.

(Jai Prakash Gupta)

H-5 : 41

S.S. CHIB, *Patterns of Population Migration in Kinnaur District, Geographical Review of India* Vol. XLVII, No. 2 June 1985, PP. 68-75

In this paper an attempt has been made to analyse patterns of population migration in Kinnaur district. Migration of population has been an important aspect of the demographic landscape in the Himalaya. This paper attempts to analyse the degree and impact of migration in this border district located in mountainous surroundings. This study is based on the analysis of Census (1951-71) data supported by field work. Permanent emigration as well as immigration to and from other areas has been almost negligible in the case of Kinnaur district. Thus, the study of migration is restricted to local migrants and outmigration only. To save the tribal culture from encroachment and the people from exploitation, the Himachal Government (1969) has already banned the sale of land to non-tribals in the district. Hence the chances of future immigration for permanent settlement have been sealed. The influx of floating population has already started showing the signs of strains on local resources. A large bulk of the energetic and tough people leave their herths and homes in early winter associated with the practice of transhumance with their flocks of sheep and goats in search of fodder and also to save their livestock from rigours of extremely cold winters. Some native people also move out of the district for education and employment in other parts of the country. The distribution of the non-scheduled tribe/caste population and its changing areal pattern over time form a fairly reliable pointer for assessing the relevant picture. The immigrants included defence and paramilitary personnel and other workers in construction activities, administrative and other services.

(Jai Prakash Gupta)

H-3 : 42

M.S. GILL AND S.B. SINGH Sex Ratio in Punjab *Geographical Review of India*, Vol. XLVII, No. 3, September 1985, pp. 34-44.

In this paper an attempt has been made to analyse the spatial patterns of sex ratio in Punjab as in 1971 by using tahsilwise Census data. Punjab has been an area of very low sex ratio during the past one hundred years or so. Frequent references to the word *Chharra* (a male who fails to get married even beyond marriage age) in the rich store of folk literature amply testify this point. In 1971, Punjab recorded the lowest sex ratio of 865 females per thousand males (national average 930). Punjab has been an area of chronic female deficiency attributable to a higher female mortality at all ages stemming from various socio-economic and historical factors. Preponderance of male births is a universal feature of human race. Punjab had recorded district increase in sex ratio from 832 to 865 during the period 1901-71. The pattern of the sex-ratio is common to all religious communities in the state. Only Jains recorded a higher ratio of females 930 per 1000 males, attributable partly to a greater male-selective out-migration of the members of the community from Punjab. Punjab had one of the lowest rural-urban differentials in sex-ratio (+12) in the country, due primarily to a greater incidence of family emigration from rural to urban areas. The sex ratio reveals marked variations by different age-groups. The lowest sex-ratios are recorded in the age-group of 70-79, beyond which sex-ratio rises again. The spatial pattern of general sex ratio is almost identical to that obtained for the rural areas. Rural sex ratio of Punjab, however displays certain distinct spatial patterns. The relatively high sex ratio in the younger age groups indicates an increased longevity of the females.

(Jai Prakash Gupta)

I-SETTLEMENTS : RURAL

I-1 : 43

NEELAM GROVER : Kanet Settlements of Siwalik Hills in Haryana : A Study of Fieldscape, *The Indian Geographical Journal*. Vol. LX, No. 1, June 1985.

The present study discuss the evolution of the Karet landscape by selecting a sample village Behlon in the Moni Hill of Sivalik range in the state of Haryana. It is believed that Karats belong to the Rajput Caste having a distinct identity of their own. The Karet settlement may be treated as a caste territory or a Karet culture area since they are both numerically and land dominant : The distinct cultural identity is reflected in their characteristic settlement landscape. Karat settlements are located in the isolated hill tops indicating a dispersed pattern. Behlon is a uni-clan unicast village of the Sispanar Karats. The most (striking) feature of the field landscape in Behlon, as in other Karat village, is the immense irregularities of shape and highly fragmented nature of cultivated land. The fragmentation is increasing due to the sub-division of the plots. Field are individually and jointly owned. The joint ownership being both the multi-generational ownerships extending across the third, fourth, and fifth generations and inter-minimal lineage wherein the member of different minimal lineage of the different generation are joint owners of the complex.

(O.P. Mandal)

I-2 : 44

ANIL K. SINGH, Evolution of the Cultural Landscape of Ballia District in the Middle Ganga Plain, *Geographical Review of India*, Vol. XLVII, No. 2, June 1985, PP. 28-37.

In this paper an attempt has been made to trace the possible chronological cultural scene in Ballia district of the middle Ganga plain with the help of place names and their relation with settling process. Forest place names are often connected with their geographical surroundings. Sometimes, they are influenced by single geographical factor such as type of forests mostly found in the immediate neighbourhood of the settlement showing its relation with time. In Ballia district, place names show the association of settlements with grass, land and shrubs rather than with dense forest. Settlement sites associated with animals are indirectly related to forests. The village having suffix *Kalan* or *Khas* and *Khurd* generally represents older or younger settlements. The village names ending in *pura*, *Purwa* or *pur* also signify the age and size of village settlement. The suffixes like *tohi*, *tola*, and *patti* indicate the spatial grouping and time sequence of settlements. The suffix *Chapra* is applied to denote the villages where people were once living in thatched huts mainly due to the fear of inundation. According to legends there appears to be some connections between Raja Ball (a leading sage) and the name of the district Ballia. Similarly, folk traditions record connection of various settlements with *rishis* (sages). With the passage of time, villages began to grow

around the tribal and clan settlements. Traditions of various inhabited villages indicate that their names are older than six or seven hundred years. Thus, it may be concluded that aboriginals had certainly a settled life in nucleated settlements and small towns or village markets. With the processes of fussion and fission, the invading Rajputs adopted some of the aboriginals traditions and cultural traits. The nature of territorial formation and its process of development is an important theme to be analysed. The details of land occupancy during medieval period are given in the Ain-i-Akbari. Land ownership clearly shows that the Rajputs were the main land-holding caste in 1985.

(J. P. Gupta)

I-6 : 45

RAGHUBIR CHAND, Functional Hierarchy of Rural Central Places in the Himalaya-A Case Study, *Transactions of the Institute of Indian Geographers*, Vol. VII, No. 2, July 1985, PP. 147-155.

In this paper an attempt has been made to examine the nature of central place hierarchy in the district of Pithoragarh, a district in U.P. Himalayas. Out of the total 2,152 inhabited villages of the district, 216 settlements were identified as rural central places.

In the present study the hierarchical grouping of central places is obtained from the array of centrality scores by employing the technique of variance analysis. The Z-value of centrality score for each central place has been calculated. The technique has revealed a seven tier central place hierarchy. The spatial pattern of central places in the study region does not confirm to hexagonal lattice arrangement due to the diversified topography and varying settlement population densities of the region. The valley bottoms and ridge tops concentrate 40 per cent and 22 per cent central places while 38 per cent centres are found on mid-slopes. It is, therefore, clear that the distribution of central places in the study area may not be defined under any geometrical rule. Similarly, central places are mostly developed along motorable roads and influenced by factors like surface slopes, accessibility and consumers travel distance etc.

(Jai Prakash Gupta)

J-SETTLEMENTS : URBAN

J-1 : 46

MANAS DASGUPTA AND SANJIB BASU, Urbanisation and Agricultural Yields-A case Study of West Bengal, *Indian Journal of Regional Science*, Vol. XVII, No. 1, 1985, PP. 25-32.

The paper attempts to bring out the relationship between urbanisation and agricultural yields in the context of West Bengal. The objective of this paper is to test whether the degree of urbanisation influences in any significant extent the yield and size of holdings. West Bengal belongs to the group of Indian states which was relatively more urbanised in the year 1971 and nearly 24.7 per cent of the total population of the state were living in the urban centres. However, there are considerable variations among the different districts of West Bengal in respect of Urban population. Districts of Howrah and Hooghly and to a certain extent 24 parganas are more urbanised than other district of West Bengal, Malda, Coochbehar, Purunia, Bankura, Midnapur, and Birbhum have smaller percentage of urban population.

The relationship between yield of rice and cereals and degree of urbanisation is found to be positive. The relationship between average size holdings and degree of urbanisation is not very obvious. In other words, the relations are poor fit and values are not significant. Contrary to the expectations, yield and average size holdings are positively related. Further average size holdings and degree of urbanisation have very weak relations with the yield in agriculture. In almost all cases the authors have found a very weak relationship between average size holdings and degree of urbanisation. The agricultural yield can best be explained in terms of manure consumption, rainfall and irrigation facilities. It shows that in West Bengal, under the limitation of data and the limitation of cross-section analysis, yields per hectare can best be explained in terms of water input.

(Sudhir Malakar)

J-2 : 47

NINA SINGH, The Development Process and Urbanisation in Newly Organised States: A Case Study of Haryana,

Population Geography. Vol. VII, No. 1 & 2, June-December, 1985, PP. 49-59.

The study examines the process of development in general and urbanisation in particular in Haryana State since its formation in 1966. Haryana has experienced rapid urban growth during the post-1966 period. The large scale influx of refugees and their rehabilitation in large numbers in towns of Haryana after the partition of the country in 1947 made a distinct impact on the level of urbanisation.

Haryana experienced a marked acceleration in its urbanisation process since its formation in 1966 and during the decade 1971-81 Consolidation of land holdings, reclamation of cultivable waste land, expansion of agricultural land, extension of irrigation, onset of 'green revolution', increase in agricultural production, progress of dairying, expansion of agro-based industries, transport, trade and commerce, education, health facilities, administrative functions, local socio-economic factors, and establishment of many new urban and industrial estates during the period 1966 to 1981 provided the major stimulation for urban change and growth.

In spatial terms, the tract along Grand Trunk Road and in the zone peripheral to Delhi was most noticeable for rapid growth.

Urbanisation showed an upward trend in both size of population and numbers of towns between 1951-61 and 1961-71 census decades, while the urban population registered an increase to 1.77 million; the number of towns also increased to 61 from the earlier position of 68. The numbers of towns grew to 77 in 1971-81 recording an urban population of 2.82 million.

Urban population grew by 35.02 to 59.49 per cent in 1951-61 and 1971-81 respectively. The proportion of urban population living in class I towns increased from 26.23 per cent in 1971 to 56.68 per cent in 1981. Despite a rapid growth rate, there was only small increase in percentage of population from 17.0 percent in 1951 to 21.9 per cent in 1981.

The paper also accounts for distinct regional variations in the urban growth rate and increased spatial disparities in levels of urbanisation in the state.

(R. L. Sharma)

J-2 : 48

SRIDHAR SEETHARAMAN, An approach to the Understanding of the Occupational Structure of Small Towns in Tanjore District in Tamil Nadu. *The Deccan Geographer*, Vol. XXIII, No. 1, Jan-June 1985, PP. 31-38.

In this paper an attempt has been made to analyse the occupational structure of small towns as revealed by the working population in Tanjore district of Tamil Nadu. In order to bring out the underlying dimensions of the occupational structure and their hierarchial grouping, the factor analysis of nineteen variables using the principal component method has been employed. Urbanisation is a component of regional economic development because urban centres provide, inter-alia, a wide variety of centralised services for the surrounding zone of influence in a wide variety of situations which are necessary for regional development. The transformation of rural service centres in both time and space due to the concentration of commercial, transportation and professional services gives rise to the development to urban centres. The increasing intensity of such processes over a landscape leads to urbanisation. Urbanisation brings with it regional prosperity as the provision of infrastructural facilities stimulates the development of locally available resources, thus increasing regional income and employment levels.

(Jai Prakash Gupta)

J-3 : 49

HAISHIKESH MONDAL, Growth of Market Centres in Nagpur City, *Geographical Review of India*. Vol. XLVII, No. 1, March 1985, PP. 13-18.

This paper seeks to understand the nature and trend in the growth of market centres in Nagpur city. The growth of market centres plays a vital role in the socio-economic life of a city and its prosperity and contributes to the increase in the intensity of trade relationship with other trade centres within and outside the city. Nagpur is a commercial city of 217.56 square kilometres with a population of 12,15,425 according to the 1981 census. The city developed mainly because of its ideal location at the apex of a triangular region, rich in agricultural, mineral and forest resources. It appears that the city has got many functional centres endowed with different administrative and commercial units knitted by good transport network. Daily and weekly markets are a common sight in the city. The location of markets is an important factor for

easy and quick marketing of essential commodities. It is observed from the analysis of the locational aspects that the growth of these market centres is not haphazard, and, the pattern of distribution is uniform serving all the segments of the city. The nature of market centre is mainly controlled by its location, transport system, arrangement of shopping centres, types of markets, types of goods, intensity and variety of shops, class and size of population depending on it. Though there is a reciprocal relationship between the growth of market centres and the growth of urbanisation, the principal accent in this paper is laid on the role of marketing system in relation to urban development. The growth of the city towards the east has been spontaneous forming a low-income area. Poverty and inadequate education have been found to have been mainly responsible for the development of this area. On the other hand, the western part is inhabited predominantly by the middle and upper-middle class sections of the population.

(Jai Prakash Gupta)

J-3 : 50

OM MATHUR, Urban growth in South Asia. *Population Geography*. Vol. VII, Nos. 1 & 2, June-December, 1985 PP. 83-91.

This paper deals with two elementary questions : (i) what exactly is the urban status of the South Asian Region (S.A.R.) in comparison with other major less-developed regions such as Africa, Latin America and South-East Asia and the less-developed countries (LDC) as a composite region, and ii) what is the urbanisation trend in the seven countries of South Asia.

The SAR, where 21.5 per cent of the population lived in urban areas and the urbanisation coefficient is 0.511, which is least urbanised in the world. The level of urbanisation in South Asian region in 1980, is much lower (23.15 per cent) than that of the LDCs (30.53 per cent) as a whole. The South Asian Region however, is experiencing a high growth rate in its urban population (51.59 per cent) this is marginally higher than the growth rates in the LDCs (44.26 per cent).

There are striking variations in the level trend and growth of urbanization within the S.A.R. region. The variations include the size, geographical configurations, increasing population, growth rates and per-capita income in different countries which comprise the region. The proportion of people living in urban areas range between 3.42 per cent in Bhutan and 28.27 per cent in Pakistan.

The rates of urbanisation varies from a meagre 5 per cent (Nepal) to as high as 22.26 per cent (India). The urban population growth rate varies from 44.42 per cent (India) to 85.06 per cent (Bangladesh). Similarly; the rural-urban difference in population growth rate ranges between 64.71 per cent (Bangladesh) and 20.66 per cent (India). The broad correspondence between the level of urbanisation and per capita GNP is bought out by a positive correlation between the two in the S.A.R. countries.

All available indications show that the urbanisation and urban related issues have begun to receive increasing attention in the south Asian countries.

(R. L. Sharma)

J-4 : 51

PHANIBHUSAN ROY, Random element in the Distribution of urban Settlements in West Bengal : 1901-71. *Indian Journal of Regional Science*, Vol. XVII, No. 2, 1985, PP. 69-71.

The paper attempts to analyse the distribution pattern of urban settlements in West Bengal. The study has been carried out for the period 1901 to 1971. The unit of study is a district. The distribution pattern has been analysed with the help of nearest neighbour index.

The findings of the paper shows that for West Bengal as a whole the distribution of urban settlements is random. It is almost random in the districts of Murshidabad, Nadia, Medinipur and Bankura. There is a definite tendency towards randomness in the districts of Howrah, Hughli, Burdwan, Birbhum, Koach Bihar and Puruliya. In the districts of Parganas the distribution of urban settlements has all along been nearly half-random, half-clustered and the random element in the distribution is on the decline in the district of Darjeeling. Random element is almost absent in the districts of Malda, West-Dinajpur and Jalpaiguri.

The findings in brief indicate that the urban settlement pattern of West Bengal is nearly random, even though at district level there are deparatures from the poissomian randomness. In majority of the districts, however, the distribution of urban settlements has either been random or been approaching randomness.

(Sudhir Malakar)

J-8 : 52

SUCHIT SUR, Periodic Markets and Spatial Integration.
Indian Journal of Regional Science, Vol. XVII, No. 2, 1985, PP.
 1 -15.

The present study is an study of periodic Markets in the Siliguri sub-division of the Darjeeling district of West Bengal. The study attempts to establish the nature of distribution of markets with reference to specific location and time and observation. Their deparature from the predicted theoretical pattern of proximity in space. to test this hypothesis, 39 market places and their 63 meetings have been analysed with the help of nearest neighbour index. The nearest neighbour indices have been calculated to ascertain the spatial pattern of distribution of markets in each day of the week and that show both random and uniform patterns. As far as traders visit pattern is concerned, the study shows that while visiting markets, the traders particularly have shown general preference for either higher or lower level markets. The analysis on spatio-temporal arrangements of markets, traders' visit pattern, consumer's visit pattern, spatial interaction integration and organisation of periodic markets has clearly established the fact that from spatial point of view the size, function, hierarchy and specialisation of markets and their temporal characteristics are such that both people and settlements are generally within a very short psychologically convenient and physical distance in comparison to many areas studied. Moreover, the geographical distribution of different orders of markets and their frequency or meeting is such that from the consumers spatial interaction point of view difficulties are expected in certain parts of the study area as link between low order with high order markets does not present a fully integrated system with possibilities of such link only in few days in a week.

(Sudhir Malakar)

J-9 : 53

K. V. SUNDARAM, Re-Orientating rural development-learning from experience. *The Indian Geographical Journal*. Vol. LX, No. 2, December 1985, PP. 133-140.

This paper identifies some gaps in the present orientation of rural development programme in India. This study is based on the experience gained from Kundrakudi village of Tamil Nadu. The

author has suggested some alternative approaches from the rural development programmes.

In the Kundrakudi village the local people worked through the government system to achieve better results on farm. The villagers made an organisative called village planning forum which took care of the conception and implementation of the programmes launched by the villages. This forum functioned on participatory basis incorporating villages and the government functionaries. The development of programme was assisted by the experts in respective fields. After analysing the relative success of the Kundrakudi experience author identifies the gaps which inadvertently could not be avoided. The gaps identified by the author are the absence of effective receiving and utilizing mechanism, lack of effort to train local leaders for initiating rural development programmes, and absence of group action programmers. After identification he suggested that some solution such as the receiving mechanism at the village level with adequate safeguard to the target group must be strengthened. In this manner that the target group could be made aware, organised and institutionalized into powerful groups. A training institution is necessary to train the local leaders in order to bring them closer to the government function areas. The constant interaction between the two group is necessary.

The author is of the view that the present integrated rural development programme called be re-oriented in the light of identification the gaps that has been identified by him.

(O. P. Mandal)

J-10 : 54

L. R. SINGH, Perspective on the nature of Indian slums. *The Deccan Geographer*, Vol. XXVIII, No. 1, Jan-June 1985, PP. 79-94.

The paper provides various perspectives on the nature of Indian slums. Slums are a universal phenomenon and are the product of urban explosion which has accompanied industrialisation and has caused physical and social stress to the urban milieu, particularly in the developing countries, which have failed to cope with the ever increasing R-U stream of migration and haphazard growth of urban morphology. Rapid industrialization, shortage of housing, inadequacy of resources, and unplanned growth of urban areas are the main causes of the slums. Slums attract rural migrants in vast numbers because of greater opportunities of employment as well as physical facilities and social amenities. Indian slums have already acquired the notoriety of

being worst in the world. The growth of slums and squatter settlements is an overt symptom of deep-seated social malaise arising out of uncontrolled growth of their population and amorphous growth of urban morphology which has succumbed to mounting pressure of shelter for low income groups. The author presents in length the problems of the slum area. The slums are a reality of the urban morphology of India's large metropolitan cities. The attempts by civic authorities, according to the author, to improve the conditions in the slums have been by and large sporadic in nature, which have at best provided half-way solutions. The aim is to create a healthy residential environment by prevention, and rehabilitation as applicable to varied conditions in the respective slum areas. There is an urgent need for an integrated development strategy for housing low-income groups and the urban poor. The government should also make statutory provisions for housing industrial workers by the industrial concerns. These measures as the author feels, will effectively curb the propensity for slum and squatter settlements.

(Jai Prakash Gupta)

J-10 : 55

PUSHPA AGNIHOTRI AND D.S. SRIVASTAVA. Slums of Sagar City . An Evaluation of Improvement Plans, *Geographical Review of India*, Vol. XLVII, No. 3, September 1985, PP. 45-48.

In this paper an attempt has been made to evaluate the effects of the improvement plans for upliftment of the urban poor living in slum areas of Sagar city. Sagar city with a population of 207,000 persons (1981) has been selected because 8.50 per cent of the city's population lives in about 25000 hutments in seven slums. Slums are not as problematic for Sagar city as they are in larger cities of Indore or Bhopal. Basic problems such as congestion, population, poor drainage, muddy and unlit paths, etc., have remained untouched due to lack of funds and enthusiasm among the civic authorities. In spite of heavy expenditure by the government on slum-improvement programmes, little sums to have changed the conditions of the shown dwellers and there remains great scope for voluntary agencies to take up work in these backward pockets of the city. There should be measures to bring immediate relief to the slum dwellers. Moreover the government should go for a greater awareness drive regarding these improvement plans, so that the slum dwellers can effectively benefit from these endeavours, which remain, by and large, unknown to them.

(Jai Prakash Gupta)

L-REGIONALISATION, REGIONAL DEVELOPMENT PLANNING

L-4 : 56

D. N. SINGH AND S.C. RAI. The Concept of Spatial Organisation. *Geographical Review of India*, Vol. XLVII, No. 3, September 1985, pp. 19-24.

This paper is an attempt to understand the concept of spatial organisation in an historical perspective, and its applicability with special reference to planning. Spatial organisation embodying variety of components and approaches is a multi-dimensional and more comprehensive concept. It may be well inferred from various discussions regarding the space and its organisation that spatial organisation can be of immense use as a guideline in different planning contexts. As a strategy, it demonstrates some variations with reference to different areas having heterogenous physical and socio-economic characteristics. It is felt that the task to derive generalizations regarding the material content upon which an overall theory of spatial organisation could be built is not very easy. A close relationship is stated to exist between the central place system and the spatial organisation of the space economy. The interplay of three-essential elements: demand of space, indivisibilities, and economics of scale and costs of transportation and movement-is sufficient at least to explain the general pattern of clustered dispersion of agglomeration points within larger evenly populated agriculture areas. In fact, a more comprehensive framework is required to obtain the influences and interdependencies of location factors, and to make possible, useful generalizations pertaining to systematic variations in space of production techniques and the size of industrial plants, shopping centres and communities as well as the regularities in the spatial distribution of settlements.

(Jai Prakash Gupta)

L-5 : 57

CHATTOPADHYAY, SRIKUMAR : Some Considerations for Geographical Research on Inequality in India. *Geographical Review of India*, Vol. XLVII, No. 1, March 1985, PP. 58-63.

The paper is a critique on the nature of geographical researches which are undertaken usually without a reference to the social processes and suggests fresh approaches to understand inequality in a geographical framework. Analysis of the infrastructure and attempt to explain its variability in the light of natural constraints and human initiative ultimately to achieve regionalisation according to the author grossly overlook the internal social processes, which are primarily controlled by the political economy. Though India has registered a substantial growth in agricultural, industrial and other socio-techno-economic front, it is a pity that a large number of people (nearly 51.87 per cent) still live below poverty line. Most of the present day geographical studies have little to say regarding the poverty ridden people. Studies on enterprises, labour and agriculture, land holdings are noteworthy. Keeping aside the present concept of rural-urban dichotomy a fresh look is needed to study the rural-urban relationship. Using the standard of living as an index, delimitation of rural, urban and urban fringe areas will provide some alternative to understand the relation between spatial structure and space economy. Proper assessment of the impact of different infrastructural facilities is needed. Human geographers in India have to find out alternative ways to explain the inequality in the socio-economic realm in our society. Detailed analysis, discussion and concerted professional efforts are needed to reach the goal.

(Jai Prakash Gupta)

L-5 : 58

DESASHVI DAS : Disparities in Rural India : Some Basic Issues, *National Geographer*, Vol. XX, No. 1, June 1985, PP. 23-29.

In this paper an attempt has been made to study the disparities in rural areas of India. These areas provide abode and employment to more than three-fourth of total population of the country. The development of these areas depend upon the measures related to the alleviation of rural strains, rural crisis and rural poverty. The various types of socio-economic problems which result from inter-personal inequalities, socio-economic class differences and inter-spatial disparities, creates obstacles in the way of rural development. These disparities are still persisting in the Indian economy and the process has been termed as 'neo-colonisation'. The small regional pockets of agriculturally developed areas have overgrown by neglecting the surrounding vast backward areas. In these pockets the agricultural economy, however, is not dynamic in terms of change in labour productivity but it is developed and

healthy only in terms of per hectare productivity. Moreover, the prevailing social structure of the rural areas is not so conducive to capture innovative components, emanating from urban areas. This has failed to mobilise and motivate the weaker sections of the community alongwith others, for the betterment of levels of living of the rural people. The economic growth achieved by India after independence has failed to provide for economic equality and social justice to the weaker sections of society and the backward regions.

(D.S. Sandhu)

L-5 : 59

RATTAN LAL SHARMA, JASBIR SINGH AND SHER SINGH DHILLON. Regional Disparities in Levels of Diversification in Rural Economy in India. *Geographical Review of India*. Vol. XLVII, No. 2, June 1985, PP.6-12.

This paper is an attempt to understand the regional disparities in levels of diversification in rural economy in India. A study of rural non-farm workers and their concentration is imperative for an understanding of the regional patterns of levels of industrialization/diversification in regional economy, and has been used here as one of the indicators for measuring levels of living standard, on the basis of the percentage of rural non-agricultural population in areas of overwhelmingly subsistence economy. Nearly 12 per cent of rural workers are required as non-farm workers in rural India to perform the non-basic functions for the rural economy in the countryside. Seven per cent of the total rural workers in 1981 in rural India were engaged in production and services for area other than rural. This low percentage, therefore, on the whole represented a very low-degree of diversification of rural economy in India. It follows that higher the percentage of non-farm workers, higher is the level of diversification of rural economy, and vice-versa. The slight increase in the non-farm workers may be attributed to the extension of health, transport, marketing and educational services in the countryside. The diversification of rural economy was at a low level in most parts of the country, especially in tribal regions or in several districts of Indo-Gangetic plain. A low per capita agricultural productivity and meagre level of urbanization are the twin variables common to all these areas. The spatial pattern of rural non-farm workers can serve as an efficient indicator for obtaining a comprehensible regional picture in respect of disparities in the diversification of rural economy. In spite of considerable economic development since independence, India's rural population has remained

virtually synonymous with agricultural population. The slow process of disagriculturalization is characterictic feature in all the developing countries of Asia.

(Jai Prakash Gupta)

L-6 : 60

B.N. MISRA AND S.N. TRIPATHI, Constraints of Rural Development : A Case Study of Basti District, U.P. *National Geographer*, Vol. XX, No. 1, PP. 67-74.

After independence the Government, through successive five year plans, have launched several developmental programmes for rural areas. These developmental programmes have been largely directed towards catering to the demands of the growing population. But none of the development programmes have achieved its objectives and the quantum of relief that these schemes have brought about is meagre. The vagaies of rainfall, drought, floods, erosion and soil leaching and atmospheric disturbances which disrupt the seasonal rhythm of an agrarian economy are the main physical constraints which frustrane the developmental programmes. The area suffers from drought and flood almost in every alternate years. The growing population, subsistent farming, small and marginal landholding, poor extension services, poverty, poor infrastructure and slow industrialization are some of the constraints which hamper the developmental programmes. Most of the developmental programmes do not produce the desired results, because of the fact that development policies designed at the top level viz., planning commission, development councils, planning boards and various ministries, are framed without keeping in mind the realities and problems of the area concerned. For the successful implementation of development programmes, it is however, essential that physical and cultural constraints are rationally eradicated. The programme should be designed to face calamities and casualties too. The planners should devote adequate time for acquiring knowledge of regional realities and problems and should design development policies with respect to them.

(D. S. Sandhu)

L-6 : 61

KRIPA SHANKAR, Some Aspects of Rural Development, *National Geographer*, Vol. XX, No. 1, June 1985, PP. 13-21.

In this paper an attempt has been made to study the present agrarian structure of India, which is not conducive to growth. The agrarian structure is characterised by a large section of people living in abject poverty, while the surplus generating households are not disposed to utilise the surplus in a productive manner. The surplus in such cases are diverted to unproductive channels and status building. There has been much talk about rural development schemes of giving loans to the landless and marginal farmers for purchase of some productive asset like milch cattle, transportation equipment, etc. The rural poor account for almost half of the country population. Their contribution to revenue through the excise duty on various utilities account for not less than what is proposed to be spent on them through rural development schemes. The surplus of the national economy is also not likely to be diverted to the rural areas as in a market economy the resources are found to flow to more remunerative sectors. Under these circumstances, overall planning towards rural development will fail to deliver goods. The political power structure in such situation will only be a manifestation of the given economic structure wherein the narrow interest of a tiny class of owners of the resources will be pursued at the cost of general rural welfare. This will further perpetuate class disparities and regional differentiation in terms of socio-economic development.

(D. S. Sandhu)

L-6 : 62

ANJANA P. DESAI, On Perceiving Problems of Rural Development. *The Deccan geographer*, Vol. XXIII, No. 1, Jan-June, 1985, PP. 95-102.

The paper analyses the general problems associated with rural development programmes in tribal and rural areas of Gujarat. In the post-industrial era the management and utilization of resources and life-styles of people have led to a dichotomous division between the rural and urban environment. The government has undertaken various developmental programmes to minimise the regional disparity from socio-economic points of view. It has been realized that poverty is associated with certain groups of people at certain places. In tribal areas, the patterns of man-environment relationship is rather poor resulting in low yield, low income, poor health, and, education, and hence, a low level of quality of life. Both human as well as physical resources are at a low levels of development. The tribals are located on marginally productive areas of rugged, forested, draught or flood-prone rural areas where life is

perpetually affected by natural hazards. The level of technology is too rudimentary to control such hazards. The need of the day is to stress the programmes related to the development of people-their education, employment and health so that people themselves will be capable of generating their own technology based on local resources. An improved human resource will certainly be able to utilize the physical resource as per needs in terms of priority. The involvement and participation of the people is the key to the success of rural development programmes.

(Jai Prakash Gupta)

L-6 : 63

P.J. SANJEEVA RAJ, Rural Development Planning and Ecological Concern, *The Indian Geographical Journal*, Vol. LX, No. 2, December 1985, PP. 141-144.

This paper attempts to highlight the ecological dimension of the rural development programmes by taking the case of Pulicat lake. The author identifies various problems faced by the local fisherman who are totally dependent on this lake. He also suggested that by judicious exploration of local resources with the help of appropriate technology and at the same time safeguarding cultural values of the villages concerned one may evolve a strategy which may go a long way in the course of development of the 'rural' areas.

Pulicat lake is the second largest brakishwatar lake in India extending between Andhra Pradesh and Tamilnadu along the Bay of Bengal. The lake is joined by a narrow opening into the sea through which the sea water along with the sea food enter into the lake. Thus the lake is rich in Prawn, fish, crab, oyster, calm algae etc. Around 20,000 fisherfolk are totally dependent on this lake. The major problem, the fisherman encounter are hurricane, cyclone, gale storm, tidal wave and deposition of bars during the severe monsoon. The cyclone and hurricanes distroy the nets, boats and houses of the fisherman. After the severe monsoon the lake mouth is closed thus sea fish cannot enter into the lake. This causes reduction in the income of the fishermen. Now a days, the operation of travelers in the lake is creating major ecological crisis in this area. The nets of the trawler fishermen are so fine that it literally combs the sea bed and catches all variety of fishes of all size, reducing the catch of the conventional fishermen and also affects the fish production of the lake over a period of time.

The author has suggested various measures for the betterment of the local fishermen, such as, precautionary measure against the

severe monsoon, cyclone etc., creation of trawling zone, digging the outlet of the lake, small cottage industry based on the seafood, coconut plantation which will provide the fuel, food and fibre for the local people.

(O.P. Mandal)

L-4 : 64

STEPHEN SUMITHRAN AND ALI ZOHAIR, Eco-Development Strategy for the Tribals of the Kolli Hills, South India, *The Indian Geographical Journal*, Vol. LX, No. 2, December 1985.

This paper deals with the living conditions of the tribals in Kolli hills and suggests an strategy for the economic development for the area. The Kolli hills is located in Salem district of Tamilnadu inhabited by the tribes known as Malaiyalees meaning mountain people. Their population is about 23,800 inhabiting an area of over 283 square kilometres. The hill is covered with tropical dry evergreen vegetation. The department of social forestry is presently trying to convert this area into a monoculture area. The tribes are basically dependent on agriculture practising both wet and dry cultivation, producing paddy, ragi, somai, varagu etc. They produce bumper crop of variety of fruits like guava, oranges, pineapples which are sold to the middleman at a very cheap rate.

The area has been neglected in every respect. There is no surface transport facility, medical facility, schools and electricity. Goitar diseases is most prevalent in this area among the adult tribes.

The author emphasises that the construction of surface road should be undertaken immediately in this area and a co-operative society be established to eliminate the middlemen in the course of marketing of their products. The regular medical facilities and electricity supply should be provided. Establishment of primary school in every village is very necessary. The facilities should be provided to them for the agriculture and coffee plantation since the climate and soil is suitable for production of these plants. The tribal people should be trained in the use of HYV seeds and chemical fertilizers in order to augment their farm production and thus raise income levels.

(O.P. Mandal)

L-5 : 65

HEMLATA RAO, Regional Disparities, Dimensions and Typology of Development in Karnataka, *Indian Journal of Regional Science*, Vol. XVII, No. 2, 1985, pp. 35-46, 4 Tables.

The present study is intended to fill the gap that exists in the field of regional planning in India. An attempt has also been made to identify differentially developed taluks in terms of an aggregate level of development, to analyse the dimensions and typology of development of taluks and to delineate homogeneous groups of taluks for formulating differential plan strategies. The study covers 175 taluks of Karnataka and 10 sectors namely - agriculture, industry, education, health, transport, communication and power, banking and cooperatives. In all 85 development indicators are selected and distributed among the above mentioned 10 sectors. The period chosen for the study is between 1975-76 and 1979-80.

In the present study an inter-regional comparison of relative levels of development has been made on the basis of the factor analysis method.

An overview of all the differentially developed taluks brings out the following factors responsible for the overall development or backwardness - the location of taluks in the favourable or unfavourable physio-climatic conditions, historical and political background of the regions; proximity to or distance from urban and metropolitan centres and administrative status of the taluks, and socio-economic development efforts of the planner.

The study, in short, demonstrates a method for measuring the levels of development, identifying backward regions, dimensions and typologies of development based on their levels of development and incorporates all the above for a meaningful utilization for formulating block development strategies.

(Sudhir Malakar)

L-5 : 66

B.D. PARMAR, Intra-regional Imbalances in Development of Saurashtra: A Quantitative Approach, *Indian Journal of Regional Science*, Vol. XVII, No. 2, 1985, pp. 87-94, 1 Table.

This study aims to identify the relative levels of development with the help of inter-sectoral analysis of each district of

Saurashtra region and to highlight the causes of intra-regional imbalances obtaining in the process of development. For the purpose of estimating the level of economic development of each district as well as Saurashtra as a whole, data were drawn from secondary sources for the period 1961-1976. The level of economic development of each district and that of Saurashtra has been estimated and compared at two points of time i.e. 1961 and 1976. Generally the method of principal component analysis has been used in constructing composite index of development.

The main findings of the study are firstly - there are noticeable intra-regional disparity in economic development of Saurashtra, and that it has continued to persist over the period between 1961 and 1976. Secondly, the disparity in agricultural development was mainly responsible for intra-regional imbalances obtaining in regional development in Saurashtra in 1961. Thirdly, the disparities in agricultural and tertiary sector are mainly responsible for intra-regional imbalances obtaining in 1976. And lastly, there has been little change in intra-regional imbalances in Saurashtra during 1961 to 1976.

(Sudhir Malakar)

P-ENVIRONMENTAL STUDIES

P-5 : 67

E.SWAMINATHAN, D. DHANPAL AND N. MURUGESAN, Spread of Parthenium Plant and Environmental Hazard in Madurai City: A study in Perception of Public, *The Indian Geographical Journal*, Vol. LX, No. 1, June 1985, pp. 9-16, 3 Tables, 2 Maps.

In this study, an attempt has been made to measure the perception of people with regard to the environmental hazard created by a plant - Parthenium - which affects the health of people in the Madurai city. In the present investigation the occurrence of Parthenium plant in any area is considered as an environmental hazard because it causes ill health to the residents of the area. The main aim of the study is to identify the area of spread of Parthenium plant in Madurai city and to measure the perception of people about the plant.

Parthenium is a weed which grows very fast in any type of land. The seed spreads through the air. Generally this weed is found along the railway tracks, roadside, and in open space around the

houses. In Madurai it has spread in 17 wards out of 65. The author is of the view that the weed would have come to India along with the imported wheat from USA during 1956.

The plant is a health hazard since it produces skin allergy, eczema, and asthma. Parthenium is also allergic to the cattle, sheep, goat and pigs.

The author found that the level of concern among the public about the weed menace is quite high in Madurai city. About two thirds of respondents perceived the Parthenium as a health hazard. The reaction of the respondents towards eradication of this plant is quite encouraging. However, the level of perception varies from person to person depending on occupation, income and educational levels.

(O.P.Mandal)

P-4 : 68

MEHDI RAZA AND HANIFA BANO, Ecological Burden of Tourism: A Case Study, *The Geographer*, Vol. XXXII, No. 2, 1985, pp. 13-20. 1 Diagram.

There has recently been unprecedented expansion of tourism owing to increased leisure, higher standard of living, improved education and speedy transport and communication. It has contributed positively to regional and national economy by promoting employment and infrastructural development, boosting income and generating foreign exchange. But tourism has also had an adverse impact in the degradation of environmental quality and disruption of the delicate ecological balance beyond the regenerative capacity of the ecosystem, leading to serious commulative consequences which are often irreversible.

The authors in the present study have tried to examine the impact of tourism on the ecosystem of Dal lake of Kashmir. The aim has been to find out the negative ramifications of tourism in terms of degradation of environmental components of the lake.

In order to cater to increasing number of tourists there has been an increase in the number of homeboats, hotels and restaurants in and around the lake. These accommodations have made the lake a dumping ground for their sullage, garbage and filth leading to growth of weeds which have together added to large-scale water pollution. The water has become highly polluted in terms of

its chemical composition. The amounts of ammonia, nitrogen/nitrite, nitrogen, phosphorus, dissolved oxygen, pH and bacteria are all in excess of the generally accepted levels.

Considering the seriousness of the danger to the lake's ecosystem, the authors suggest immediate freeze of the present situation and not allow any further construction of tourist infrastructure along the periphery of the lake. Later a long term plan should be formulated in conformity with the ecological constraints. Rearrangement and relocation of houseboats and scientific regulation of drainage and sewerage will help in minimising the danger and increasing the scenic beauty and health of the Dal lake.

(M. Farooq Siddiqi)

P-6 : 69

BIRESHWAR BANERJI, Genesis of Floods in West Bengal and Their Impact on Society, *The Deccan Geographer*, Vol. XXIII, No. 1, Jan-Jun. 1985, pp. 39-53. 2 Tables.

The paper is an attempt to understand the causes of floods in West Bengal and their impact on society. The Bengal Basin is characterised by its flat riverine terrain formed of alluvium deposited during floods. The flood plains of West Bengal continue to be the principal economic hub of the State. Containing among other, rich fertile soils, most productive farmlands, thick concentration of industries, dense cluster of settlements and diverse communication networks. Limited floodings are beneficial to crops and improve the fertility conditions of the soil by deposition of fine detrital matters over it. When the magnitude of flood exceeds the tolerant limit, it causes colossal damage to life and property, houses, and crops, roads and railway system and in other walks of life. In West Bengal, floods are a common phenomena and cause considerable damage to life and property every year. The prognosis of the recent floods give rise to the realisation that there are no escape from floods in West Bengal under the existing situation and consequently, people should only keep themselves prepared to live with this natural hazard. It is necessary to investigate the extent and magnitude of various problems associated with this natural hazard in West Bengal and to adopt both short-term and long-term measures to ameliorate them. However, it is also important to maintain the ecological balance of the valley which should not be disturbed by unnecessary human interference.

(Jai Prakash Gupta)

Q-GEOMORPHOLOGY

Q-1 :70

KARMAKAR, B.M., S.R. KULKARNI, S.S. MARATHE, AND R.B. GUPTA Some Tectonic Features of Western Maharashtra Postulated but not Proved, *Annals National Association of Geographers India*, Vol. V, No. 1, June 1985, pp. 24-33. 1 Map, 5 Diagrams.

Several authors have postulated the existence of tectonic features in the stable Deccan Trap area of western Maharashtra. This study refutes the above assertions, and suggests that the features of tectonic implication are difficult to recognise in the field. For example, disturbed rock structures that should invariably be associated with the supposed fault of some 300 kilometre length at the base of the western scarp are not in evidence. Also, excavations for the Koyna Project from the right bank of the Koyna river on the plateau upto the coastal tract through the continental divide, the scarp and its base fail to support any evidence of faulting in this area. Evidence from these excavations also refutes the generally held view that the right angle distortion in the north-south alignment of the Koyna river at Helwak is the result of a fault north of Helwak through which the river has developed its course.

This investigation further suggests that faulting within the lava is uncommon phenomenon. Some previous studies had shown that since the sequences of lava flows abruptly terminate or peter-out laterally, these indicated faulting. According to this study, the disposition of the lava beds in vertical and horizontal sense should be reinterpreted. Similarly, the existence of Panvel flexure that is known to extend for some 200 kilometres has also been questioned. Also, a large number of 'sheer zones' in the Deccan Trap are shown in this study to be vertical or steeply inclined fractures, some of which are related to rock-rotting.

(V.K. Sharma)

Q-3 : 71

RAJAN, P.K., K. SASEENDRAN, D. SALIM, AND RAMACHANDARAN K.K. Geomorphology of the Periyar Basin, Kerala, *Geographical Review of India*, Vol. XLVII, No. 4, June, 1985, pp. 7-13. 3 Tables, 2 Maps.

The Periyar is the longest river in Kerala, and its basin spreads over an area of 6,721 square kilometres through highlands, midlands, and lowlands. The lithologic framework is also varied, and comprises of charnokites, hornblend biotile gneisses, granites, laterites, sands, and alluvium. The highlands as also the midlands are marked by major lineaments.

The morphometric analysis of the drainage network suggests that the drainage density of 2.2 to 3.6 is in conformity with the relief properties; it being high in highlands and low in lowlands. The bifurcation ratio of 4.3 to 6.0, and the computed length ratio of 1.6 for the Periyar basin also follows the Horton's laws respectively of stream numbers and stream lengths. Also, the laws of stream orders, and the relation of basin area to discharge are also shown to apply to the basin under study. The presence of several knick points on the longitudinal profile of the river occur along major lineaments, and are thought to result from tectonic instability of the region. Lastly, the average sinuosity index for the Periyar channel is given as 1.5.

(V.K. Sharma)

Q-3 : 72

S.C. JOSHI. Degradation and Stream Capacity on Krol Rocks During Monsoon Rains: Illustration from a Himalayan Watershed, *Transactions, Institute of Indian Geographers*, Vol. VII, No. 1, January 1985, pp. 1-7. 3 Tables, 1 Map, 2 Diagrams.

In this paper, an attempt has been made to assess the quantum of degradation and stream capacity during the monsoon rains in the basin of river Mandal expanding across the Krol rocks encompassing an area of 286.19 square kilometres of planimetric area. The river is one of the principal tributaries of the Western Ramganga that drains a large area in the south-central sections of the U.P. Himalaya. The basin entirely falls in the district of Pauri and has a hydrological station at Maidabani that records the stream discharge, silt delivery as well as rainfall. The main objective of the paper is to present the volumetric indices of the stream networks of the Krol rocks by relating its capacity to the inflow of discharge during the monsoonal rains.

In order to obtain the effect of monsoonal rains on water discharge and silt delivery of the Krol rocks, correlation and

regression analysis have been adopted to measure the association and to compute the altometric rates of change between these parameters respectively. Correlation coefficients were computed between stream discharge and rainfall, and silt delivery and rainfall by using the data for the period 1977 to 1982. The results suggest a strong and positive correlation between stream discharge and silt delivery on the one hand and the quantity of rainfall on the other.

The analysis leads to the following postulates; (i) stream discharge and silt delivery are largely controlled by monsoon rains, (ii) 1 mm monsoonal rain produces 1,40,000 ha m/Km² water discharge in the Krol rocks, and (iii) 2 mm monsoon rain degrades the Krol rocks to the extent of 0.58 ha m/Km² silt delivery as expressed by the altometric models constructed by integrating regression analysis between stream discharge (Q) and rainfall (R), and between silt delivery (S) and rainfall (R).

(Jai Prakash Gupta)

Q-3 : 73

SRIKUMAR CHALTOPADHYAY AND M.B. SALIM. Morphological Classification of Land and Assessment of its Suitability for Various Uses - A case study on Bavalipuzha - Aralampuzha Drainage Basin, *Transactions of the Institute of Indian Geographers*, Vol. VII, No. 2, July 1985, pp. 105-112. 4 Tables, 2 Maps.

An attempt has been made in this paper to classify land according to morphological units and suggest a method for an optional use of land based on the classification. The Aralanpuzha - Bavalipuzha drainage basin is located in the north-western flank of the Wynad plateau and covers about 400 square kilometres. Morphologically the area is an interesting one having a strong structural control on the drainage pattern.

Morphology forms the basic matrix to promote any kind of economic activity in a region. Due to increasing demands on land there has been a tendency to use almost all kinds of land for certain purposes without due regard to their suitability.

In this paper, an outline of morphological classification of land and assessment of its suitability for various uses have been studied. On the basis of morphogenetic process, 16 environmental geomorphic units are identified under the two broad categories: fluvial land, and man-made system. These units are further assessed

for their suitability of wet land agriculture, tree crops, irrigation, settlement, scientific and cultural interest and conservation. It is observed that a number of units are highly suitable for wet land agriculture, tree crop and settlement. There is naturally a certain amount of competition to promote these types of landuse in all these morphologic units.

It is observed that most of the units are mutually exclusive to host different landuse types. However, units with polyfunctional character (suitable for hosting more than one landuse type) are also marked in the study area. As part of the Western Ghat region, with high topographical variations, this region warrants a meticulous landuse planning.

(Jai Prakash Gupta)

Q-3 : 74

VASANTHA VISHWANATH AND A. GANESH, Hydrometeorological Characteristics and Water Balance of the Upper Vaigai Basin, South India, *Transactions of the Institute of Indian Geographers*, Vol. VII, No. 2, July 1985, pp. 163-170, 1 Table, 6 Maps.

Water is the most essential resource for human use. It is basically an input in agriculture. It is important to analyse the quantity of water available and the use to which it is put to, thus facilitating to assess whether at the present rate of exploitation, the surface and subsurface water will be available for future adequately.

The study, employing the book-keeping procedure of Thornthwaite and Mather, attempts to bring out the hydrometeorological characteristics and water balance of the upper Vaigai basin, Tamil Nadu. The basin located in a rainshadow region of the Western Ghats receives on an average 883 mm, rainfall per annum resulting in poor water storage position in the years of normal rainfall.

At first, the spatial distribution of mean annual rainfall and potential evapotranspiration are analysed. A budgeting estimate of water deficiency and surplus is also attempted. Finally, the implications of water balance elements are discussed with the view of water resource development. The potential evapotranspiration is higher in the northeastern part of the basin and also in most of the plain areas. The region of water surplus is restricted to the hilly tracts of the lower plains and water deficiency is quite high in rest of the region demanding serious attention for a careful agricultural planning.

(Jai Prakash Gupta)

Q-3 : 75

VISHWAS S. KALE AND S.N. RAJAGURU. Alluvial and Sub-Alluvial Morphology of the Western Upland Rivers of Maharashtra (India), *Annals of National Association of Geographers India*, Vol. V, No. 2, December, 1985, pp. 1-9, 11 Tables, 1 Map.

The paper attempts to bring out the spatial and temporal variation in the alluvial deposits and the sub-alluvial rock basement in western Maharashtra. The alluvium in this region belongs to two generations, Pleistocene and mid-Holocene. The estimation and reconstruction is based on the drill-holes data and extensive field work. The study highlights the differences in the extent, thickness and textural and chemical characteristics of the alluvial deposits, with wide range of size, shape and lithology. Lithologically and sedimentologically three primary strata of horizons have been identified. In western Maharashtra there are three types of deposits: (a) upper fine, (b) lower coarse, and (c) colluvio-alluvio deposits. These deposits respectively represent: an over-bank fill of meandering rivers in the semi-arid regions; gravels deposited by non-meandering low sinuosity channels, and fill of steeply sloping and ephemeral streams. The coarse gravel are diagnostic of proximal non-meandering streams; thick, fine, and asymmetric are indicative of meandering stream. The texture of the braided sandy-pebble fill suggests that either suspended sediment was not present or it has been transported from the other areas. In such cases stream provides no evidence of a decrease in stream power in relation to the upper areas. The old deposits have morphological similarity with present channels and in these channels some time identical features are observed during post-monsoon period. The alluvial silt is undoubtedly fluviogenic in alluvial regions and during the pre-alluviation period rivers were cutting laterally as well as migrating in sub-alluvial regions. It can be concluded, that, the fluvial regimes and climatic conditions during late quaternary were limited to present ones and there has been fluctuations in the degree only and not of kind.

(D.S. Sandhu).

Q-6 : 76

S.N. KARLEKAR. The Tidal Landforms of Urban-Alibag-Murud Coast of Maharashtra, India, *Transactions of the*

This paper attempts to understand the nature of landforms, especially the mud flats—conspicuous coastal features in northern coast of Maharashtra. Although such landforms are also found along rest of the Maharashtra coast, the northern coast between Uram and Alibag is known for its exceptionally wider mud flats. The formation of wider and thicker mud flats is generally associated with high tidal range, greater than 3 meters. It is also a well known fact that they develop usually in areas sheltered from the effects of wind driven waves.

The mud flats near Uram, Revas and Avas are not completely flat and have a gentle slope seaward. These are elongated and are completely under the influence of daily tides. The area is characterised by a medium to high tidal range. The mud flats, in addition to sheltered areas, are also seen to be occupying the open stretches of shoreline. The highest of the high tidal currents are responsible for relatively drier upper parts. The mid tide velocity drop is inferred from the break in slope in the central part of these mud flats.

The channel development is a function of nature of substratum and the exceptionally high widths, a result of recent fall of the sea-level.

(Jai Prakash Gupta)

Q-6 : 77

P. SANKARA PITCHAIAH, P.N. RAO & A.T. RAO. Recent changes at the Estuary Mouth Along the Coast of Prakesan District, Andhra Pradesh, *The Indian Geographical Journal*, Vol. LX, No. 1, June 1985, Tables 1, Map 1.

The present study reveals the shifting courses of the rivers in the coastal area of Prakasam district of Andhra Pradesh. It also briefly discuss the process of the shifting of the individual rivers. The coastal configuration near the river mouth is studied, based on the toposheets, landsat imageries and field work.

Gundlakamna, Musi and Paleree are the important river in Prakasam district, situated south west of the Krishna delta. The river Gundlakamna is pererial in nature while Musi and Paleru are intermittent. Gudlakamna has shifted its course 14 km south-west to its earlier course. This has been substantiated by the extensive

marshy land found North-east of the present day course of the river. Musi and Palaru rivers have shifted their course towards the south-west of their earlier course.

The author is of the view that the river does not confine itself to a particular channel especially in its lower reaches. Over a long period of time, the river mouth extends as the levels which build into the sea and thereby their course lose their gradient advantage in that direction. So the river cuts its channel somewhere upstream and finds a new shorter and steeper route to the sea. In this process Gundlakamma and Musi river shifted its course. However, the author gives different reason for the shifting of Palaru river. The Palaru river shifted its course due to the deposition of the sand bars in the mouth of the river.

(O.P. Mandal)

R- HYDROLOGY

R- 78

KRISHNA BHAGAVAN, S.V.B. AND RAMANA RAO, K.L.V. Evalu-ation of Groundwater Potential from Air Photographs in Cuddapah Basin, *Geographical Review of India*, Vol. XLVII, No. 4, December 1985, pp. 67-74, 1 Table, 1 Map.

The potential for groundwater in Cuddapah basin, Andhra Pradesh, has been investigated with reference to the geomorphic units, and relevant geological aspects. The occurrence and potential for groundwater has been evaluated for the five major geomorphic units as river-built plain, broad valleys with infilled sediments, narrow valleys, active pediment, and piedmont zone which have been recognised and delineated on aerial photographs and Landsat imagery.

The river-built plain along Cheyyeru, Pulang Eru, and Patagunjana rivers is built of gravel, sand, silt and clay materials. The groundwater occurs under water tables and semi-confined conditions at depths between 2 and 7 metres below the surface level. Shallow tubewells yield water at the rate of 30,000 to 100,000 litres per hour (l/h). Broad valleys are composed of colluvio-fluvial sediments overlying pebbles, gravels, and boulders. These valley-fills along the river courses possess high specific yield of the

aquifers. The depth to water table varies from 2.5 to 15 metres. Dug wells in such an environment yield groundwater at the rate of 1,250 to 7,500 l/h. With the water table 1.5 to 12 metres below the surface, the narrow valleys can yield 1,250 to 6,500 l/h. Here, the valley-fill deposits of colluvio-fluvial nature overlie limestone beds. The active pediments are composed of rock fragments and a thin cover of red sandy soils over a bed of quartzite rocks. Groundwater has been observed under water table and semi-confined conditions mainly within the shallow cover of weathered residue and fractured zones on active pediments. The groundwater potential is determined to be poor with the average yield of wells in the range of 1,250 to 2,700 l/h. The piedmont zone has a slope between 3° and 5° . Consequently, the surface runoff is rapid, and the groundwater potential almost negligible.

Several abandoned channels have also been recognised. These provide good aquifers for the accumulation of subsurface water. Several lineaments, such as fractures and faults, have also been recognised and delineated using remote sensing techniques. The study indicates the significance of such structural features in the movement of subsurface water from areas of high to low potential.

(V.K. Sharma)

S-CLIMATOLOGY

S-1 : 79

MURALIDHARAN, V., KURIAN, P.P., VINAYAK, P.V.S.S.K. AND SAMPATH, S. Orographic Effect of the Western Ghats on the Monsoon Rainfall, *Geographical Review of India*, Vol. XLVII, No. 4, December 1985, PP. 32-37, 3 Diagrams.

Interpretation of a 50-year annual rainfall series from 1901 to 1950 for two set of stations - one each for the west and east-facing stopes on Western Ghats around 10° and 11° north latitudes - suggests that the southwest rainfall on the west-facing slope increases from about 600 metres above the mean sea level, and reaches a maximum value around 1,300 metres. It decreases further up the slope, clearly showing the effect of orography in enhancing the amount of rainfall on the windward slope. Similarly, the orographic effect of relief on the northeast monsoon is also fully developed on the east-facing slope of the Western Ghats. The winter rainfall increases from about 370 metres, and attains a peak value

at about 1,800 metres above the mean sea level. Thereafter, it decreases continuously with elevation. Such a relation of elevation-rainfall is in conformity with some of the previous studies for tropical regions.

(V.K. Sharma)

S-2 : 80

SINGH, N., RAO, P. GOVINDA, AND RUPA KUMAR, K. Variability of Distribution of Annual Precipitation in India. *Geographical Review of India*, Vol. XLVII, No. 4, December 1985, pp. 38-49. 4 Tables, 1 Map, 3 Diagrams.

Mean annual rainfall data for 462 stations, of which 291 are situated in north India and the remaining 171 in peninsular India, have been analysed statistically to determine the variability and distribution of annual rainfall in India.

Linear regression models of standard deviation on the mean annual precipitation have been developed separately for the total population, for the stations in north and south India, and for the meteorological subdivisions of the country. The study reveals that for the equal amount of rainfall, its variability is generally higher in the north than in the south India. Further, the variability varies in a hyperbolic manner with the variability of precipitation amount. Also, an inverse relation between the coefficient of variability and the amount of rainfall has been found to hold good for the meteorological subdivisions of India, except in the case of West Bengal where it increases.

The coefficient of correlation between the standard deviation and mean annual precipitation total has also been established for the 14 meteorological subdivisions. The study suggests that such an association is the highest in West Bengal and the lowest in Bihar. Average probability relationships have also been derived. It is suggested that probability relationships are useful for generating data for regions with gaps in precipitation series, and for generating precipitation zones of specified levels of probabilities.

(V.K. Sharma)

S-5 :81

MODLEY, D.A. AND PARTHASARATHY, B., A Probability Model for Areal Extent of Drought/Flood over India During Summer Monsoon Season, *Annals, National Association*

of Geographers, India, Vol. V, No. 1, June 1985, pp. 34-44, 4 Tables, 1 Map.

Long-term rainfall data from 1871 to 1978 spread over 306 raingauge stations situated in each of the districts, except the mountainous tracts, are used to develop probability models of droughts and floods in the country. The incidence of drought or flood over a district is defined by two criteria. The first criterion considers percentage departure of seasonal rainfall from the normal rainfall. This aspect takes into account the variability of the normal rainfall over the region. The second criterion, referred to as standardised rainfall value, accounts for the variability of the normal rainfall and of the standard deviation over the region. According to the first criterion, an area is categorised as drought or flood area if the percentage departure of monsoon rainfall over the area is respectively less than or more than 25 per cent. In the second criterion, rainfall is expressed as a standard deviate. The limits of standard deviate are placed at < 1.28 for a drought and > 71.28 for a flood situation.

On these two criteria, the districts suffering from drought and flood are identified and the total area of the country affected by drought and flood computed. The study concludes that the series of drought/flood in the monsoon season from June through September are homogeneous and random. Further, these are significantly and positively skewed. It is also suggested that the gamma probability distribution best describes the drought/flood series. The analysis of rainfall series based on the gamma probability distribution suggests that country was hit by seven large-scale droughts between 1899 and 1920, while three floods occurred during 1878-1893 and 1956-1961.

(V.K. Sharma)

T- SOIL GEOGRAPHY

T : 82

SARKAR, SUBIR, Studies in Genesis of Catenary Soils in the Ajodhya Highlands of Purulia District, West Bengal, *Geographical Review of India*, Vol. XLVII, No. 1, March 1985, pp. 25-35, 4 Tables, 1 Map.

The physical environment, profile characteristics, and some of the mechanical and chemical properties of the soils in Ajodhya

highlands situated on the eastern part of the Chottanagpur plateau have been analysed. The study reveals that the pedogenesis and profile development reflect even minor variations in the topographic and moisture properties. Hence, the soils may be best described by the catena concept. The soil catena is primarily a function of relief and its indirect effect on moisture characteristics. The other variables affecting the soils of catena are the patterns of erosion and deposition.

The soils of this region follow a sequence of reddish brown clay loams on the plateau surface to pale brown sandy clay loams on the hill slopes, and gray brown loamy sands on the foot hills. In these three physiographic divisions, the composition of parent material, climate, and biotic influences on soil profile development are essentially uniform.

Many soils of the region are polygenetic, developed entirely on granites, gneisses, alluvium and colluvium. Such conditions account in part for the relatively high base-exchange capacity, mixed clay minerals, and medium fertility of many red soils on the moderately old geomorphic surface. On the plateau, the soils are relatively young, and developed on extensive recently deposited sediments on steep slopes and recently eroded slopes of the dissected plateaus. Azonal alluvial soils are not as extensive due primarily to the recent uplift of the region.

(V.K. Sharma)

W-1 : 83

G.S. OBEROI. How Topographical Maps Could be put to a Variety of Uses, *Annals of the National Association of Geographers, India*, Vol. V, No. 2, December 1985, pp. 55-57.

This paper, seeks to bring out the variety of ways the topographical maps can be used, e.g. preparation in geographical research. The author also provides an account of the topographical maps, scale, its availability at different Map Sales Offices, and also about the functions of the Survey of India a Government agency - related to its functions, in this regard.

The paper mentions the usefulness of the topographical maps on 1 : 50,000 scale for obtaining useful information on any area; and enlists seventeen aspects where the topographical maps are of great use. Therefore, the paper asks for a wide publicity of the topographical maps through different media which may benefit its users. It also seeks sale and display of the topographical maps at

various places and on various scales. It gives information regarding its procurement, including restricted ones.

The author also indicates that publication of topographical maps on 1 : 25,000 scale is of more use in mapping and interpretation of socio-economic data, regional physical conditions, broad landuse and spatial organisation of human settlements. The Survey of India should ensure the availability of the topographical maps in its offices prepared at different scales at all times as well as for the sell with the reputed dealers located in district towns. It is also requested to be made available the topographical maps of the restricted areas for the academic purpose.

(K.N. Prasad)

W- METHODS

W-2 : 84

P. SUDARSHAN. Identification of Backward Districts in Andhra Pradesh - An Application of Factor Analysis, *Indian Journal of Regional Science*, Vol. XVII, No. 2, 1985, pp. 17-22. 2 Tables.

The paper attempts to identify the backward districts in Andhra Pradesh with the application of factor analysis method which the author uses for analysing the differentials in the levels of development of Andhra Pradesh across the districts for the period 1978-79. The results of such an exercise could be useful to the planners engaged in incorporating the district level planning in the preparation of the Seventh Plan.

Except the capital districts of Hyderabad and Nizamabad the entire Telengana is categorised as backward in this scheme. In coastal Andhra, out of 8 districts six districts viz., West Godavari, Krishna, East Godavari, Guntur, Vishakhapatnam and Nellore are shown to highly developed districts. Srikakulam, Anantapur are the least developed districts in coastal Andhra and Rayalseema regions respectively. In the entire state Adilabad is the most backward district.

Low communality of indicators like percentage of area under commercial crops, number of pumpsets per lakh hectares of gross area sown, post office per lakh of population suggest that they have little in common with other variables employed in the study. However, the low communality value of percentage of villages and

towns electrified is not amenable to explanation. On the theoretical grounds, this indicator should have had high loadings on the first factor.

(Sudhir Malakar)

W-2 : 85

S.R. SINGH, Quantitative Analysis of the Hiran Catchment for Land Resources Development and Management: A Case Study based on Aerial Photo Interpretation, *The National Geographical Journal of India*, Vol. XXXI, No. 1, January 1985, pp. 10-17, 3 Tables, 1 Map, 1 Diagram.

In this paper a quantitative analysis of the Hiran catchment in Jabalpur district has been carried out to understand the physical and hydrological characteristics of the area for land resource development and management. The analysis is based on the aerial photographs.

The paper presents a description of geology and geomorphological set up, quantitative analysis of the drainage morphology drainage pattern, its order analysis, bifurcation ratio, drainage density, stream frequency of the Hiran catchment which has six sub-catchments. Their separate and comparative description is necessary as number, order and length of stream, drainage density, and stream frequency are largely influenced by the geology, its structure and slope of land, and thus, results in various shape and size of the individual sub-catchment and express the chronology of their evaluation. Large variation in bifurcation ratio ranging between 2.88 and 7.41 suggests past tectonic movements. High values of drainage density and of stream frequency in sub-catchments of Labheva and Kair indicate severe erosion and excessive run-off and great hydrological potential. Infiltration numbers 0.164 and 0.023 related to the Kair and Kirthai sub-catchment respectively indicate highest and lowest permeability of the surface material compared with the other sub-catchments. Thus, the quantitative analysis of properties of the catchment will be helpful for land and water assessment.

(K.N. Prasad)

1986

B - POLITICAL GEOGRAPHY

B-2 : 1

R.N.P. SINHA, *Geographical Foundations of International Understanding* (Hindi), *Bhu-Vigyan*, Vol. I, No. 1, 1986, PP. 38-41.

The geographer's attempt to study the political pattern and behaviour of states as related to geographical conditions can very well help in realising the goal of international understanding. The author holds the view that a very important aspect of international relations has been the highly distorted perception of one's own state and that of others which can be corrected only by an objective geographical study of the state concerned. In various ways, geography of a state creates the possibility of international tensions. Among the physical elements of states, location and size are very significant in this respect. States with disadvantageous location would try to improve it at the cost of the other states thus leading to international conflict. But the location cannot be changed. Among the human factors over-population may lead to demand for more space. Dissatisfied minority groups (racial, linguistic or religious) instigated by other states are constant source of tension.

The paper considers economic inequality as a function of the variations in the geographical environment like climate, soil and geological structure etc. which create variation in the capacity to produce wealth in terms of agricultural, forest and mineral resources. This points towards international cooperation for exchange of commodities through world trade. Maps have also helped in the formation of global views. But misinterpretation of maps has also resulted in confused thinking in international relations. Now, better appreciation of maps projections and the construction of better global maps have helped in our thinking about international understanding in the nuclear age. The study concludes that once the minds of statesmen and politicians are impregnated with the geographical concepts, there can be some hope for international understanding.

(R.B. Singh)

C-SOCIAL AND CULTURAL GEOGRAPHY

C-3 : 2

R.L. SINGH, Ecological Processes of Tribal Development in India (Hindi), *Bhu Vigyan* Vol. I, No. 1, 1986, PP. 28-31.

Modern agencies of development and patterns of resource utilization are largely responsible for disturbing the ecological balance particularly in tribal areas in India, such as Damoder-Mahanadi and Narmada-Son basins and in the Himalayan areas. The land, water, forest and atmospheric resources as also the health and well-being of the people have been so threatened as today. Each one of the major natural resources has been degraded to an unbelievable level with amazing rapidity. We have been losing 1.3 million hectares of forest almost every year, a good deal of which is located in the environmentally critical zones and the tribal belts.

The current demographic trends together with those of livestock indicate the magnitude of the existing and potential burden on environment particularly on renewable resources. We have to become aware of the biospheric challenge posed by all kinds of pollutions on the nearly one third of the known species which are facing the danger of extinction. We have to conserve through wild-life sanctuaries the representative samples of fast dwindling ecosystems in the form of 'gene pools'. This will help in the restoration of ecological balance.

The author includes that the tribal habitat still suffers from relative ecological isolation from other areas and the spillover of modern developments has not yet entered into their 'little worlds'. Their habitat is to be gradually transformed with the help of appropriate technology providing low-cost energy resources and bio-fertilisers to improve their economy based on locally available resources.

(R.B. Singh)

C-3 : 3

S.C. KHARAKWAL, Socio-Cultural Study of Jads of Uttarkashi District (Hindi), *Bhu-Vigyan*, Vol. I, NO. 1, 1986, PP. 42-46, 1 Map.

The present study seeks to analyse the socio-cultural pattern of Jads, a typical tribe of upper Bhagirathi valley in Uttarkashi district of Garhwal. The valley of Jahnvi, the uppermost tributary of the

Bhagirathi, is the native home of the Jad society which has developed its own geographical personality. Most of the information about the tribal people has been obtained from two important Jad villages - Jadung (3,700m) and Bagori (2,560m), through interviews, and personal observations by the author. Regarding the origin and evolution of the tribes the author has presented a view different from those observed by writers, i.e. E.T. Atkinson, Rahul Sanskritayan, C.A. Sherring, H. Harrer and S. P. Dabral etc.

Explanations have been provided for their way of life and culture as adjusted to their typical environment and historical tradition. The study accounts for their nomenclature, migration, living traditions and culture. Regarding nomenclature, the author interviewed two old people i.e. Lala Amar Singh Jad (78 years) and Mor Singh (68 years) from the same community. The impact of the tibetan religion on their culture and social life is a witness to their historical roots and contacts with the Tibetans, although the relations have been severed after the Indo-China conflict in 1962. The study shows that in spite of attention paid by the government, the social and economic conditions of the Jads are still primitive. Lack of education and socio-political awakening is a great constraint. There is, therefore, a need for the modernization of their tradition and improvement in their economic status. Due to limitations of agriculture, the Jads have to supplement their livelihood by sheep rearing, trading wool and related products. They are also involved in production various wood products.

The study is largely exploratory in nature.

(R. B. Singh)

C-3 : 4

SUDERSHAN MUKERJEE, The Nicobarese Artisans of Chaura Island, *Geographical Review of India*, Vol. XLVIII, No. 2, June 1986, PP. 63-68, 1 Map.

The Indian islands of Andaman and Nicobar group are culturally very different from the mainland. Distance may be responsible for strong cultural differences among the islands themselves. The present paper aims at finding out as to how far the induction of modern technology has affected the Chaurite artisans of Nicobar Islands.

The Chaura Island till recently had dominated the economic, social and cultural life of the Nicobarese. Despite the island being devoid of raw-materials like clay and wood, the artisans of Chaura island developed indigenous methods of manufacturing earthen

pots and wooden canoes by bringing raw-materials from the neighbouring islands. Canoe building is the main stay of the Chaurite economy, the need of which arises from the location of the island itself.

The author gives a detailed account of the major economic occupations of the Chaurites which include canoe building, pot making, and gardening.

In the concluding paragraphs the author indicates that the induction of aluminium utensils has considerably reduced the demand for Chaura pots and baskets in the central group disrupting their economy in a big way.

Lastly, the author urges the social scientists to plead for an integrated development for the island and its people.

(Shikha Sharma)

C-7 : 5

AIJAZUDDIN AHMAD, "Socio-Cultural Change in a Developing Society : The Case of India" in M. Shafi and Mehdi Raza (eds.), *Spectrum of Modern Geography*, (New Delhi : Concept, 1986), PP. 243-66. 7 Tables, 1 Map.

The paper examines the socio-cultural changes which are taking place in the light of the conservative and the modern outlook in the Indian society. The author is of the view that socio-cultural changes may be rapid if the social group has generated in internal dynamism of its own which encompasses all spheres of material culture and affects all segments of the population. On the other hand, it may be slow or imperceptible, if it gets stagnated by historically determined or socially caused inertia which thwarts internal dynamism and arrests progress. It may be progressive or regressive depending upon the value system that provides for the logic for discriminating between positive and negative dimensions of change.

Contemporary Indian society is characterised by contradictions of a very high order. An elitist section of society has undergone at least a century of modern education and has remained exposed to national thinking, secular beliefs and a scientific world-view. Its exposure to media has contributed towards its consciousness of human values that transcends the limits imposed by the prejudices of caste, creed, language, religion or ideology. On the other hand, metropolis like New Delhi retains within its

confines dozen of medieval villages where hardly anything has changed.

India has achieved self-sufficiency in foodgrain production and yet some 300 million people live below the poverty line. The nation has developed an impressive infrastructure for primary school education. However, millions of parents in rural as well as urban areas are constrained to keep their children away from schools as they are needed at home as 'earning hands'.

Assuming education plays a crucial role in the process of social transformation and further assuming that agricultural development in a predominantly agrarian society is expected to create favourable conditions for the spread of literacy, the statistical correlation between agricultural productivity and rural male literacy did not prove helpful. However, it is evident that neither the levels of literacy nor of productivity display an homogeneous spatial pattern. Both the phenomena are fragmented in space although for different reasons.

(R.K. Mandal)

C-7 : 6

MEHAR SINGH GILL, "Social Transformation in Hissar District, Haryana", *Geographical Review of India*, Vol. XLVIII, No. 4, December, 1986, PP. 14-20. 1 Map.

The two states of Haryana and Punjab have experienced rapid social changes on account of extension of irrigation facilities since independence. The purpose of this paper is to regionalize the pattern of social transformation in Hissar district during 1951 to 1971. During this period, far reaching changes were observed in this district with a subsistence agricultural economy. Factors responsible for such a transformation of spatial patterns are two : (1) The extension of Bhakra Canal irrigation to large parts of the district and the consequent extension and intensification of agriculture, and (2) considerable influx of the enterprising Punjabi agriculturalists to this district.

The method of study involved regionalization of Hissar on the basis of the rate of growth of population and change in density and the degree and type of occupational shift. Maps based on these characteristics were superimposed and then areas with rapid, meagre and moderate changes were demarcated.

Areas which have been brought under irrigation display rapid change in the demographic characteristics, ethnic composition of population, agricultural efficiency, and the growth of non-farm activities.

The second category, that of areas of meagre change includes the old settled parts of the district and the arid areas. The author, however, does not explain as to why these areas are still ridden with poverty and conservatism. The reason why extended irrigation facilities and other developmental projects failed to bring about an accelerated social transformation is not quite clear.

(Shikha Sharma)

C-8 : 7

JAYASREE DE, "Elements of Urban Health Situation in India", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, PP. 27-29.

This paper seeks to analyse the urban health conditions where a variety of elements combine and re-combine to create a condition to give a quality of life at a given point in time and space. The main elements of urban health situation are physical, socio-cultural and economic. The mere knowledge of elements is not enough to evaluate the situation of urban health, one has to go into their interaction and the processes involved. The diversity of background of people often in the urban area leads to maladjustment. The conditions and amenities, unlike the west, is much different here in rural and urban areas. The shrinking conditions of healthy environment in urban areas often makes a new rural immigrant restless in his urban surroundings. This makes and opens up the scope for the study of city environment, which will let the planners know the direction and sectors for quality of life improvement. For the purpose of evaluating the urban health two major phenomena have been considered at length. They are physical characteristics and socio-cultural characteristics. They are further sub-divided to represent the vast horizon of urban phenomenon heaving bearing on health. The major physical components and socio-cultural activities are enumerated without citing any special case study as the nature of urban area is quite varied. The emphasis is laid on the study of linkages of various elements of urban life for establishment of a better causative relationship of phenomena and problems. The author laments that the primary data is not available with the census or any municipal and other bodies in India causing stumbling block at the urban environment study.

(Afzal Raza Khan)

C-8 : 8

KAILASH CHOUBEY, "Health Services in Madhya Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, PP. 49-56. 3 Tables.

A very pertinent issue today is the availability of health services to our teeming millions. Many regions in India, especially the economically backward states have the major problem of inadequacy of health-care facilities. Individuals and organizations have conducted surveys to focus attention on the problem. The present paper is also an attempt in this regard. It provides an overview of geographical considerations of important facts which must be included in any comprehensive approach to a solution of the health problem of Madhya Pradesh.

Health care in Madhya Pradesh is expecting a crisis and thus should be of concern to the medical geographers. The author has adopted a statistical approach to the problem of insufficient health facilities. After the introduction, the author deals with the prominent health hazards of the state and demarcates rural areas and young children as the most disease-prone areas and groups. This he attributes to a limited knowledge of hygiene, improper and unhealthy sanitary conditions.

The next section deals with the prevalent health services of the state which are provided at three different levels : primary health centre, district hospitals and medical college facilities. The author, however, overlooks the base of the health services in rural areas i.e. the primary health worker.

The third section deals with the methodology. This has the following information : ratios of beds available per thousand persons, number of persons served by one doctor in each district and area served by each medical institution. Also, the ratio for the three important medical facilities for each district were ranked to obtain ranking scores for 1980.

Lastly, in the section on the "overall position" the author imaginatively mentions the plotting of the data on a map but has not produced to accompany the text. Also, the position of Madhya Pradesh (with respect to three indicator), as compared to the national average and with the best and the worst states in terms of health care facilities is missing.

The article, as a result of this, emerges only as a preliminary study and fails to advance a comparative position which would have given a ranking to the state as a whole.

(Shikha Sharma)

C-8 : 9

P.D. TIWARY, "Food Intake System and Deficiency Diseases in Rural Areas of Madhya Pradesh", *Indian National Geographer*, Vol. I, Nos. 1-2, 1986, PP. 63-71. 4 Tables.

The paper attempts to find out the consumption pattern of food stuffs and deficiencies in the rural areas of Madhya Pradesh. A dietary survey was conducted through oral questionnaire among more than 500 families in 23 sample villages. The analysis was done on the basis of ICMR recommendations regarding diet. Consumption of various food stuffs varied from place to place as well as from family to family, depending upon availability of food, local produce, environmental and ecological conditions, religious and traditional customs, personal choice and the economic status of the family. Most of the people are vegetarian and none of the selected family was found upto the mark in the consumption of food stuffs in all the respects. The inadequacy in the diet is not only quantitative but also qualitative-leading to a high incidence of both under-nutrition and malnutrition. Malnutrition is common in big families and is more acute during childhood. As a result, some common deficiency diseases are widespread. The diet of the region needs considerable improvement through modification in agricultural pattern and change in dietary habits. The author also emphasises the need for small size of family and more care for children to have the hiatus filled between the diet recommended by the ICMR and the real diet taken by the people in the region.

(R.B. Singh)

C-9 : 10

D.N. SINGH, "The Role of Education in National Development" (Hindi), *Bhu-Vigyan*, Vol. I, No. 1, January, 1986, PP. 32-37.

This paper is an attempt to discuss the role of education in national development, placing its involvement towards widening socio-economic gap between the rich and the poor and that between urban and rural population. The present system of education are

largely attributed to traditional patent structure. The worst has been the fact that instead of being utilized to improve agriculture and rural economy, education is looked upon as an avenue of escape from it. Even it did not generate love for rural life among educated persons. The author blames that the objectives of the present formal system of education is basically geared to the urban and elitist needs. Instead of organizing the rural poor into strong community groups, it divides them into various social and economic groups/classes and enhances the gross inequality already prevailing. The present system is proving to be incapable for checking the drop-out of about 80 per cent children at school level.

The paper recalls the present debate that delinking of degrees from jobs may be an answer to the growing aspiration of the youth disgusted with formal education system. No doubt, in such a changed set up, training and skill formation aspects have to be given greater attention. It will also relieve universities of undue pressure. This approach is commonly termed as vocationalization of education. Alongside, there is need for universalization of elementary education which will help linking up of productivity, and science and technology with education. It may facilitate education to all, including females, irrespective of narrow consideration of place, age-group and resources. The concept of 'life-long education', 'adult education' and the 'learning society' have relevance. In this regard, the role of voluntary agencies becomes of great importance. The role of open university system, just started in our country, has been dealt with in this paper.

(R.B. Singh)

C-9 : 11

MOONIS RAZA and Y.P. AGGARWAL, "Inequities In the Levels of Literacy in India" in M. Shafi and Mehdi Raza (eds.), *Spectrum of Modern Geography* (New Delhi : Concept, 1986), PP. 193-225. 5 Tables. 2 Maps, 2 Diagrams.

In this paper an attempt has been made to explain the inequities in the levels of literacy and its relationship with economic characteristics of population. With a view to unravelling the complexities in the process of diffusion of literacy, the authors have tried to measure and explain inequities in the territorial distribution of literacy. In this endeavour they have proposed a new method for measuring intra-regional inequities between different binominal elements of the regional space.

Six groups have been identified for the measurements of disparities in literacy rates : (i) Male-female; (ii) Rural (Male-Female), (iii) Urban (Male-Female); (iv) Rural-Urban; (v) Male (Rural-Urban); and (vi) Female (rural-urban).

The continuing low levels of literacy, particularly in rural areas and the persistence of high level of inequities partly reflect the failure to achieve the goals of universal primary education and calls for a system of territorial resource distribution of a fundamentally different kind than the present one.

In order to pinpoint the regions that require special remedial measures to raise their levels of literacy, the study has identified the districts with varying degrees of inequities in the distribution of literacy. The analysis has shown that more than half the districts in India still continue to have significantly high levels of disparities.

The examination of casual relationships corroborates the finding that the economic base of a region exerts a strong impact on the spread of literacy, and the processes of urbanization and industrialization strongly influence the levels as well as the inequities in the distribution of literates. A vicious circle of underdevelopment incorporating these characteristics has been proposed.

The finding of this study have serious policy implications for the present educational system, and evidently point to the need for a different strategy for educational development.

(R.K. Mandal)

C-11 : 12

MOHAMAD SHAFI, "Economic Development and Social Tensions with Special Reference to India" *Spectrum of Modern Geography* (New Delhi : Concept), 1986, PP. 267-71.

This paper examines the nature of economic development and the resultant social tensions in India. The course of scientific development has widened the gap between the haves and the have-nots consequently social tension arose world-wide in general and in India in particular. The migration of people from the rural to the urban areas led to their concentration in the latter. The crowding of people in the towns led to the development of slums resulting into two distinct cultures; the cultures of the elite and that of the common man. In the rural areas the culture of the elite was the

culture of the landlords, while in towns it was the culture of the factory owner or the capitalist.

The author opines that the introduction of technology without adequate understanding of its impact on employment and on society leads to distress of unimaginable magnitudes. While people are being displaced from traditional occupations, the growth of modern industrial activities employing new technologies have been rather slow to absorb the ever increasing population. The class-specific characteristics thus obtaining in the country have been such that those who possess the means and knowledge of applying modern technologies have accumulated huge capital while those who are small and marginal farmers and petty artisans have remained poor and are progressively becoming impoverished.

Realizing that such inequitous development may lead to social tensions India has embarked upon a scheme of Intergrated Rural Development Programme (IRDP). The focus of the programme is on target groups consisting of small and marginal farmers, landless labourers, share-croppers and rural artisans to whom the benefits of development have seldom percolated.

Economic development accompanied by social tension is bound to erode the structure of parliamentary democracy. Social tensions and cultural conflicts can lead to upheavals, but if measures are adopted in order to promote balanced economic development, a healthy and durable foundations for the country's democratic polity may be laid down.

(R. K. Mandal)

D. ECONOMIC GEOGRAPHY

D-4 : 13

H.S. GUPTA, "Regional Patterns of Energy Production and Consumption in the World" (Hindi), *Bhu-Vigyan*, Vol. I, No. 1, January, 1986, PP. 17-27. 3 Tables, 1 Map, 2 Diagrams.

The present paper analyses regional pattern of disparities in the production and consumption of energy in the world. Out of 191 countries mentioned in the U.N. Statistical Yearbook, only 74 produce more than 1 million MTCE energy each. The U.S. and U.S.S.R. alone produce 45 per cent of the world total energy. The per-capita energy production varies from almost nil in a number of areas to more than 100 MTCE in the U.A.E., Qatar and Brunei. On the basis of the level of energy productivity, the author divides the world into four regions i.e. (i) Very high energy productivity region (23

countries), having per capita energy production more than two times the world average, (ii) High energy productivity region (8 countries), having per capita energy production in excess of the world average but the less than two times the world average, (iii) Medium energy productivity region (17 countries) and (iv) Low energy productivity region (143 countries). The per capita energy consumption ranges from only 3 kg. CE in Bhutan to 44.570 kg. CE in the U.S. virgin islands. On the basis of energy consumption level, the world has been classified into four regions i.e. (i) very high energy consumption region (40 countries), (ii) High energy consumption region (20 countries), (iii) Medium energy consumption region (19 countries), and (iv) Low energy consumption region (112 countries).

The level of energy consumption of a country is closely related with its level of economic development. A high degree of positive correlation was observed by the author between per-capita energy consumption and per capita gross domestic product in the countries of the world. On the basis of the levels of energy production and consumption, and surplus or deficit of energy, the world has been divided into six energy balance regions i.e. (i) the U.S.S.R.-OPEC energy surplus region (22 countries), (ii) China-Egypt energy surplus region (17 countries), (iii) The U.S.A. type energy deficit region (8 countries), (iv) West European energy deficit region, (v) West Indies type energy deficit region, and (vi) India type energy deficit region. However, the basis of typologies have not been mentioned by the author.

(R.B. Singh)

D-6 : 14

S.L. KAYASTHA and H.C. RAI, "Corbett National Park-A Wildlife Recreational Resource", *Philippine Geographical Journal*, Vol. XXX, Nos. 1-2, 1986, PP. 42-50. 3 Tables, 1 Map.

In this paper the authors have highlighted the significance of wildlife parks and sanctuaries in the conservation of fauna and flora in India. In view of the fact that the problem of environmental deterioration has become a matter of serious concern even in India, wildlife parks and sanctuaries can play a crucially important role in the conservation of faunal resources. Selecting the case study of Corbett National Park, the authors have viewed this problem in the context of the U.N. programme on Man and Biosphere.

A brief account of the topography, landscape and climatic characteristics of the park area is followed by an inventory of the

fauna and flora found in the park. The authors have also described the rail, road and air connections to the park and the infrastructural facilities available inside it.

Following a 1977 study of Wall and Wright, the authors have evaluated the impact of the recreational activities on wildlife, wall and Wright developed a model (the authors have reproduced it) showing the linkages between the intrusion into wildlife habitat by recreational activity and its aftermath such as 'disturbance, alteration of habitat, killing, adaptation, migration, reproduction levels, population change and species composition.' They have cited the evidence of tourist influx from 1971-72 to 1981-82 to show that the tourist traffic has increased by more than three times over a decade.

The opinion that the settlers in the vicinity of the park have encroached on its land illegally for purposes of agriculture, lumbering, grazing and other purposes only shows that the preservation of the interests of the human population is equally, if not more, important than the preservation of nature.

(Nasim Aijaz)

E. AGRICULTURAL GEOGRAPHY

E-2 : 15

C. ROYCHOWDHURY, R. M. POFALI, J. C. BHATTACHARJEE AND K. M. MENDHEKAR, "Landforms and Landuse in Nagpur District", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, PP. 15-21. 1 Map. 1 Diagram.

Interpretation of aerial photographs supplemented by ground-truth data, facilitates identification of land forms, associated soil types and the existing landuse pattern. Using this technique, major land form units of Nagpur district in Maharashtra were delineated on 1,60,000 aerial photographs.

The stereoscopic interpretation of the aerial photographs exhibited the following environmental characteristics. The hilly region is mainly located on the northern part of the district, exhibiting a higher dissected topography on the ancient crystalline rocks. The bold ridges and hills are the relicts of the earlier mountain system which has resisted the prolonged denudation processes. The table land comprising the western and southwestern parts of Nagpur district is covered by basaltic flows with trappean characteristics. It constitutes the eastern edge of the Deccan plateau in Maharashtra and runs from the north to the southeast, occupying almost half of the area of the district. Pediment lies at the

slope of scarp faces with moderate relief ranging from 300 metres to 450 metres above mean sea-level, strewn with boulders rolled down from the scarp faces. The intervening basin occurs in the northern parts of the district and forms a nearly level landscape. The pediment alluvial plain lies between the northern hilly region and southern table land tract. It is drained by important rivers like the Kanhan, Sur, Pench, Amb and Kolar. The plain is formed out of outwash materials brought down by the streams from the adjoining hills and table land. Regionally, the area is known as Wainganga basin. The flood plains are developed along the Amb, Pench, Wardha, Wunna and Kanhan rivers. The flood plains are nearly level to gently sloping and are formed of alluvial deposits. These are characterised by terraces and severe bank cutting.

Based on the land form pattern and soil characteristics, five classes of landuse pattern of the region have been identified by the authors.

(Anjali Gusain)

E-2 : 16

Y. V. RAMANIAH AND N.B.K. REDDY, Land Use Orientation in Andhra Pradesh, *Annals of the NAGI*, Vol. VI, No. 2, 1986, PP. 57-60, 2 Tables, 1 Map.

The author holds the view that the landuse orientation in an area is affected by physical and socio-cultural factors. The term landuse orientation has been derived from the eminent Polish geographer, J. Kostrowiski. Kostrowiski has classified landuse into four types-predominant, dominant, semi-dominant and accompanying. Using the same nomenclature and the method the authors have studied the landuse orientation in the state of Andhra Pradesh.

The study shows that the arable land holds the first rank in the landuse orientation. It is distributed over 145 taluks of the state. The arable land use is predominant in 23 taluks. It is semi-dominant in 7 taluks. Forests hold a dominant rank in 7 taluks. Mixed landuse orientation indicates heterogenous physical and socio-economic conditions.

(Nasim Aijaz)

E-3 : 17

B.B. SINGH AND RAJPATI RAM, "Food Production System and Efficiency in Azamgarh District, U.P.," *The National*

Geographical Journal of India, Vol. XXXII, No. 2, 1986, PP. 127-36. 6 Tables, 3 Maps.

Agriculture in Azamgarh district is basically subsistence oriented having heavy population pressure on land with deteriorating land-man ratio. Starting with a poor industrial base, the pace of urbanisation and industrialisation has not been sufficient to absorb the annual addition in population, thereby leading to greater concentration of population in the rural areas. The backward status of agriculture also failed to feed and employ an over increasing agriculturally dependent population as the growth of food grain production failed to match the rate of increase in population. As a result, per capita production and availability of food continued to fall with serious impact on nutritional status. The basic contributing factors to low production efficiency in the region are the lower application of modern technology in the form of various improved inputs. An emphasis is, thus, required on explaining the cropping system, state of availability of food energy and production efficiency and further step in to pave the way for greater availability of food in terms of quantity and quality, remove the imperfections in the production system and to provide a congenial structure of cropping and production. Azamgarh, a district in the Middle Ganga Plain of U.P. with 29 development blocks has an area of about 5744 km². Pattern of cropping in the district is cereal-oriented as the cropped area under cereals occupies 77.04% of the Gross Cropped Area (GCA). Sugarcane comprises 6.67% of GCA. Vegetable cropped area in the district is quite insignificant with only 0.85% of total cropped land. Pulses constitute a little more than 15% area in the total cropped land use. All the crops show wide spatial variations as far as their distribution is concerned.

According to classification of efficiency scores, higher efficiency level includes 7 developmental blocks, moderately high 12 development blocks, moderately low 4 development blocks and low 6 development blocks which have sources of food efficiency varied in kind and nature. The grim realities which are perceived are that higher level of food efficiency has strong support of traditional gricultural practices than modern ones. It may be further added that it is not only the traditional practices but it is the traditional modern mixed technology which is responsible for increasing food efficiency in Azamgarh district.

(P. Raju)

E-3 : 18

JANAKI SARAN ROY, "Some Aspects of Agricultural Development in West Bengal", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, PP. 45-47. 1 Table.

The author evaluates the agricultural development in West Bengal during late seventies. West Bengal having 2-7 per cent of the geographical area of the country supports about 10.0 per cent of total population of the country. The state's agricultural activities employ great number of people and vast tracts of land i.e. 65 per cent against Indian average of 45 per cent. Agricultural development has a great role to play in course of rural development. The introduction of High yield varieties of seeds in 1965-66 is marked as the period when the agricultural vis-a-vis rural development started. The main crops affected were Boro paddy and wheat. The introduction of H.Y.V.'s diffused and now it is much easily available with the farmers of the state. The agricultural development also recorded increased use of H.Y.V.'s in Aus and Aman paddy. The importance of wheat in the agricultural development of West Bengal has also been dealt with. The other reason for agricultural development has been the diffusion of seeds of quite maturing varieties in the state. The growing rate of fertilizer use has been also an important factor for steady increase in agricultural productivity. The author, quite not satisfied with the rate of agricultural development, suggests certain measures which will help increase the rate of growth. The main suggestion relates to irrigational facilities enhancement, diffusion of H.Y.V.'s and quick maturing crops, short-term credit availability facilitate farmers to buy agricultural inputs, intensive training and educational seminar for the farmers and regular and timely supply of fertilizers. The author also names a few species which could be made popular in the state considering the environmental conditions.

(Afazal Raza Khan)

E-3 : 19

J.C. KUNIYAL AND R.L. SINGH, "Measurement of Agricultural Productivity in Naini Tal District, U.P.", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, PP. 173-78.. 2 Tables, 1 Map.

In the present paper an attempt has been made to measure agricultural productivity in Nainital district. The aggregate

performance of crop yield per unit of area (i.e. the ratio of the index of total agricultural output to the index of total inputs used in agriculture) has been perceived as the primary determinant to demarcate the agricultural weaker or efficient zones in the areas concerned. After reviewing several statistical methods on measurement of agricultural efficiency in India and abroad, the authors have followed Bhatia's method for measuring agricultural efficiency. In order to reckon the blockwise imbalances in the level of crop-production, the authors have made an attempt to select the some of the significant and crops, i.e. wheat, paddy, maize, oilseeds, pulses and sugarcane.

Ranking coefficients have been obtained and classified into 5 groups in order to observe typologies of agricultural efficiency. The index value of 100 has been taken as the dividing line. A significant belt of very high agricultural productivity (>125) stretches in the Tarai and the Bhabar region, having well-developed canal and tubewell irrigation, fertile soil and highly organized and mechanized farming. A greater part of the hilly region falls in the category of very low agricultural productivity regions (<75). In this zone, agriculture is relatively less developed and the subsistence type of agriculture with paddy, pulses and wheat as the dominant crops is grown extensively. The authors conclude that regional imbalances can be explained with reference to the diversities in physical, socio-economic, cultural and techno-organizational variables. In the hilly region, agriculture is most inefficient, while in the Bhabar tract, agricultural productivity is relatively higher than the hilly tracts. But Tarai is the only region here agricultural productivity is highly developed.

(R.B. Singh)

E-3 : 20

M.C. THAKUR and RAGHUBIR CHAND, "Agricultural Variations within Uttar Pradesh : A Temporal Analysis", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, PP. 153-60. 3 Tables.

The General feature of indian agriculture is wide inter-regional variations in growth and yield levels of various crops. In this context, the paper attempts to find out inter-regional variations in yield level of selected crops for years 1965-68 and 1975-78 in Uttar Pradesh. The study also gives some idea about the impact of green revolution on various crops in various regions. The analysis is based on three years average of data on area, output and yield of selected crops. The crops selected are five main cereals, i.e. rice, wheat, jowar, bajra and maize which together account for three-fourths of the total cultivated area of the state. The information

have been collected at district level and have been combined into five groups defined as agro-climatic regions. Compared growth rate for area, production and yield has been worked out to obtain the nature of change. Besides, annual growth rate of net irrigated area and number of tractors have also been calculated.

The study concludes that the position of different regions in terms of yield level changes from one crop to another as well as over the period. The yield per ha. of all crops except maize has gone up in the seventies. The main impact of green revolution as authors observe has been in terms of output by yield than by area. The changes in cropping pattern in favour of cereals like wheat and rice can also be attributed to seed, fertilizer and irrigation package programmes. Area under jowar, bajra, and maize has fallen down substantially. The paper also supports the well-known fact that the level and growth of yield have been observed higher in those regions which also registered higher growth in irrigated area and number of tractors. Inter-regional disparities are also quite high and has shown tendency to increase over the period.

(R.B. Singh)

E-3 : 21

VIVEKANANDA BHATTACHARYA, "The Impact of Agricultural Development in Daspur Block, Midinipur", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, Dec., 1986, PP. 99-103.

In this paper an attempt has been made to assess the impact of agricultural development on the living conditions of people in Daspur block of Medinipur. The paper has three parts. The first deals with the general physical description of the area in terms of its drainage system, climate and soil. The important rivers and canals of the area are described. The statistical analysis of the rainfall pattern during the period 1974-83 has been done by the author to present a picture as to how rainfall varies in different months. The author mentions that the area by and large is composed of alluvial soil giving good scope for agricultural development. The second section of the paper deals with the major landuse of the area. It goes on to enumerate the main crops of the area like, paddy, wheat, jute, potato, pulses and green vegetatables. The respective share of area devoted to each crop and their scope for further development is also dealt in this section. There is generally lack of information among people about the commercial benefit and the available scope for some particular crop in their particular piece of land. This puts pressure on the part of government to enlighten the farmers to improve their landuses for optimal commercial benefits,

for example, there is a great scope for flori-culture in the area but not much has been done in this direction. The third section is devoted to irrigation system of the area. The region is having about 25% of its area as irrigated. At the end of the article the author mentions some of the measures undertaken by government for agricultural development. However, the author does not go beyond naming them-a critical appraisal is lacking. The author also looks forward for a good prospect of agriculture in the study area.

(Afzal Raza Khan)

E-4 : 22

S.S. DHILLON, R. L. SHARMA AND JASBIR SINGH, "A Classification of Indian Agriculture into Major Systems", *Spectrum of Modern Geography* (New Delhi : Concept, 1986), PP. 364-78. 1 Table, 1 Map.

The primary objective of this paper is to classify Indian agriculture into major agricultural systems that may help in the description, analysis and synthesis of different agricultural situations at all levels. Thus classification is to be considered as a prerequisite for agricultural planning as it offers a helpful approach that steers the investigator to make a thorough study of the problems of agriculture in the region of plenty and poverty. The composite circumstances that contribute to the existing problems facing agricultural activities need to be appreciated critically in a spatio-temporal perspectives. As a consequences, it seems worthwhile to attempt regionalization of India into major systems of agriculture.

Various observable functioning forms of agriculture as suggested by whittlesey have been used for the basis of classification-the most important ones being (i) types of cropping, such as fine foodgrains, coarse foodgrains, oilseeds and olericulture, horticulture,, industrial, beverage and forage crops, (ii) animal husbandry, (iii) farming techniques and impliments employing wooden plough, iron ploughs, tractor horse power, and intensity of irrigation, (iv) purpose of production, (v) capital investment in farming enterprises, and (vi) the levels of agricultural productivity.

On this basis the basic agricultural systems have been grouped under four broad categories : (i) The rice region-extending from Assam valley through West Bengal Basin to include a very large part of the north eastern and the south eastern India, with a narrow strip along the western coast. (ii) The wheat region-occupying most of north-west India practising irrigation in agriculture. (iii) The

millet region-comprising mainly the dry Deccan plateau in the centre of the Indian peninsular and the arid parts of Rajasthan and Haryana. (iv) The temperate Himalayan region-including Kashmir and Himachal Pradesh where olericulture and horticulture crops are as important as cereal crops such as maize and rice.

(R. K. Mandal)

E-4 : 23

V.VIDYANATH, Agricultural Regionalisation of Andhra Pradesh, *Annals of the NAGI*, Vol. VI, No. 2, 1986, PP. 49-56, 1 Table, 2 Maps.

The author examines the need for agricultural regionalisation and holds the view that it is most essential for evolving a suitable planning strategy for optimal agricultural development. Selecting the state of Andhra Pradesh the author makes an attempt to delimit agricultural regions. While suggesting that the cluster analysis and the least square method seem to be the best technique for the agricultural regionalisation of the state, the author reviews the techniques of Weaver, Rafiullah, Thomas, Coppock and Doi. The study takes into consideration percentage of area under 17 major crops for each of the taluks of the state for a three-year period from 1979-80 to 1981-82. The taluks of the state, numbering 195, have grouped into 5 basic clusters and 13 sub-clusters. Coppock's least square method has been applied to determine the ranked crop combination for each sub-cluster regions.

The author has concluded that irrigation plays a dominant role in determining crop combination regions. This, however, seems to be a foregone conclusion. On the other hand, the role of natural factors in determining the cropping pattern seems to be highly unimportant.

(Nasim Aijaz)

E-4 : 24

Y.V. RAMANAIAH AND N.B.K. REDDY, "Crop Regions in Andhra Pradesh", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, PP. 121-30. 3 Tables, 3 Maps.

In this paper an attempt has been made to rank the crops on the basis of their relative dominance in a region. This has been further used to develop a scheme of agricultural regionalization in Andhra Pradesh. The paper may be divided into three parts. The

first part discusses the primary crop regions by identifying the crop which accounts for the highest percentage of the total cropped area in each of the component areal unit. On the basis of 1978-79 statistics, the authors identified 13 such crops regions i.e. paddy region, jowar region, groundnut region, minor millets region, pulses and grams region, and, cotton region etc. The spatial distribution of these crops indicate that paddy cultivation is the dominant crop in the coastal plains and irrigated areas of the plateau; Jowar cultivation is popular in the western rain-shadow region of the interior plateau; the cultivation of oilseeds showed spatial preference to the drylands of Rayalaseema.

Under secondary crop regions, 19 crops are identified. Among them, the trio, namely paddy, pulses, and jowar form the leading second ranking crops in that order. Paddy which is grown in 38 taluks of the state form the largest region. The number of taluks under this crop remains same in 1963-64 and in 1978-79 as well, but its area greatly shrank to 24 taluks in 1968-79. This was due to failure of the monsoon. As a second ranking crop, this crop is distributed in eastern and southern Rayalaseema as well as in isolated areas of Telangana. It is followed by pulses and grame which have been distributed largely in the Krishna and Godavari deltas and in western and north-eastern Telangana. Jowar is the third important second ranking crop, mostly distributed in the coastal plain and Telangana where paddy is the first ranking crop.

The study maintains that the diversification introduced by the second ranking crops in the crop-combination of the primary crop regions is further accentuated by the third ranking crops making it more complex. In 1978-79, as many as 19 crops have emerged as the third ranking crops in the state, among which pulses and grams (northern and north-eastern Telangana and upland of the coastal plain), paddy (Mahabubnagar, Hyderabad and Prakasam districts), and groundnut (south-central region) form the major groups. The authors conclude that the emergence of 13 primary, 19 secondary and 19 tertiary crops regions are largely due to the diverse agro-climatic and geographical conditions in the state.

(R.B. Singh)

E-6 : 25

K. NAGESWARA RAO AND HEMA MALINI, "Mangrove Environment Along the Coast of Krishna and Godavari Deltas", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, Dec., 1986, PP. 22-26. 1 Table, 1 Map.

The article presents an account of the mangrove forest in terms of its climatic, geomorphological bearing and economic potentials. Extensive area of mangrove (about 1235 sq. km.) has been studied with three main objectives-1. to demarcate the areal extent of mangrove swamps, 2. to have an idea of the prevailing climatic and geomorphological conditions, and, 3. to forecast about the economic potential of the region. The area has a typical monsoon climate seen in its different parameters of temperature, rainfall and vegetation. The study of magnitude of dryness has been done in terms of Index of Aridity (Ia) observed for all the twelve months of the year for different meteorological stations. The results elucidate the point quite clearly that the region can be classified as semi-arid. Making use of air-photographs the authors have indicated that the region could be seen as distinct not only because of its typical vegetation but also by their characteristic geomorphological set-up. The development of mangrove swamps in this region is largely controlled by coastal morphology and by the pattern of coastal swamps. This region also has a large tract of a tidal plant along the coast. The mangrove forest along the coast of Krishna and Godavari delta is classified as reserved forest. The logs are generally used as fire-wood but there are many species having great economic potential and what they need is proper management. Rao and Hema Malini suggest that inferior species be removed in order to accelerate the growth of valuable trees. The region can be used for beekeeping for honey and the environmental facilities for pisci-culture could also be exploited. To further the idea of economic potentialities the article mentions that the hidden potentials of 935 sq. km. which is much like a wasteland could be used and developed for economic gains like agriculture (in marginal area) salt production, mangrove forestation and pisciculture to name a few.

(Afazal Raza Khan)

E-47: 26

CHANDRA SEN, 'Landuse Pattern in Hills of Uttar Pradesh: An ecological Abuse', *The National Geographical Journal of India*, Vol. XXXII, No. 2, 1986, pp. 111-17. 4 Tables, 1 Map, 2 Diagrams.

A faulty land use pattern in hills of Uttar Pradesh have affected the human life not only in the hills but in the plains also through the frequent occurrence of droughts, floods and other environmental disorders. The change in the existing land use pattern based on ecological principles is urgently needed. The present analysis is based on the prevailing land-use pattern in

Dwarahat Block of Almora in Kumaun hills of Uttar Pradesh. The total geographical area of the block is about 31,618 hectares. Land use is categorised as under forest, orchards, pasture and waste land and cultivated land. Forests constitute about 13,873 hectares of land (about 43.88 per cent of total area) in the block as against 60 per cent minimum area envisaged by National Forest Policy. The orchards over about 1,670 hectares (about 5.2 per cent of total area) of land in the block. Pasture and wasteland constitutes about 7,272 hectares land (about 23.01 per cent of total area). Cultivated land covers about 8,803 hectares (about 27.84 per cent of total area) of land in the block.

A land capability classification of the Kaphra catchment of the block reveals that only 50 per cent of the total cultivated land is suitable for cultivation with appropriate conservation methods. But the crops are being cultivated on steeply sloping land also. Growing pressure of population on the land and reduction in the yield rates seems to be the main reason of extension of crop cultivation to lands which are not suitable for the purpose.

The analysis indicates that the existing land use pattern in the hills is disrupting and deteriorating the eco-system. An appropriate change in the land use on ecological basis is urgently needed. The land unsuitable for cultivation but can be put under permanent vegetation like orchards and other perennial crops. Natural vegetation should be preserved on the land that has not yet been terraced for cultivation. Oak and other broad leaved forest species should be planted in the areas most susceptible to erosion. Scientific grass land management involving improved grass species with controlled and regulated grazing should be introduced.

(P. Raju)

E-7: 27

DAYA RAM, "Maturity Patterns of Rainfed Crops in Hissar" *Geographical Review of India*, Vol. XLVIII, No. 1, March 1986, pp. 38-45. 1 Table, 2 Maps.

The present paper attempts to study the changes in crop maturity patterns between 1971-72 and 1984-85 of rainfed crops in Hissar Tehsil of Haryana. This has been done in the wake of green revolution in the country, after which the research findings and their extension to the farmers have played an important role in crop performance in both irrigated and rainfed crop areas.

The study area and its physio-climatic conditions are introduced which are followed by the details on the methodology used by the author. The study is based on the comparable data of crops sown and matured area by both Kharif and rabi seasons. Thus were obtained maturity indices for all the crops and their differences calculated. A high difference in the crop maturity index values depict high degree of change in the crop maturity patterns in both positive or negative directions.

Bajra, guar, moong and *desi* cotton are taken up as kharif crops for which five classes depicting the degree of positive change and three classes showing negative change. Among the rabi crops taken into account are gram, sanson, taramina.

The general conclusion that has rightly been drawn is that, taken together, both rabi and kharif crops changed mostly in the positive direction. However, clear variations are pointed out in between the two crop categories. That is, for planning purposes it is pointed out that rabi crops require more improvement than the kharif crops - as their maturity patterns are lower.

The last section provides clues for ways and means to be adopted for improving crop maturity. These include growing drought tolerant and disease resistant crops, maximum utilization of rain water, irrigation etc. The author, however, has overlooked a few details, e.g. the sources of data have not been mentioned in the Tables. That has been included in the article. Also the role of credit societies in improving the maturity patterns has not been dealt with.

(Shikha Sharma)

E-8: 28

J. SINGH AND RAM AWADH, " Agricultural and Population Dynamics: A Typological Analysis of the Awadh Region" (Hindi), *Bhu-Vigyan*, Vol. I, No. 1, January, 1986, pp. 7-16. 3 Maps.

In the present paper, the authors have attempted to analyse the areal variation in landuse and population dynamics of the Awadh region on the basis of deviation indices of food and cash crops and levels of population pressure in the different development blocks. Three types of agriculture-population dynamics regions have been identified. These are (i) potential, (ii) stagnant and (iii) problematic. The potential region includes 75 blocks where population pressure is in general low but having good

potentiality of surplus agricultural production. These blocks are again grouped into prospective, progressive and advanced areas. In the stagnant region, the population pressure is medium. Due to intensive use of land resulting into loss of soil fertility at present, surplus production is not possible. The region includes 75 blocks which may be divided into three groups: subsistence, commercialized and diversified with increasing deviation indices of cash and food crops. The problematic region has high pressure of population which has threatened all attempts towards improving the agricultural situation of the region. This is again subdivided into three classes i.e. depressed areas, developing areas, and distress areas with deteriorating situation on the basis of deviation index.

The authors conclude that in a predominantly agricultural region like Awadh, the economic scene has been revolving around the state of relationship between agriculture and population pressure. The region has a very low level of technological development. However, there is enough scope for development with proper provision of infra-structural facilities.

(R.B. Singh)

E-8:29

R.J. MISHRA, "Impact of Consolidation on Farming: A Case Study of Dobhi Block, Jaunpur District, U.P." *The National Geographical Journal of India*, Vol. XXXII, No. 2, 1986, pp. 118-26. 9 Tables, 2 Maps.

The excessive pressure of population on agricultural land has resulted into the subdivision and fragmentation of village land holdings. But measures of land reforms like consolidation (1967-68) have provided big plots of farmland leading to improvement in the entire farming system including ploughing efficiency, irrigated area, cost of agricultural operation, use of fertilisers, cropping of HYV of seeds, caloric availability etc. Six villages of Dobhi block of Jaunpur District, (middle Ganga plain) of U.P. have been selected to assess the above aspects. The study area can be divided into 3 physiographic units: (i) the Gomti Khedar and ravine land, (ii) central low land and Bangar tract, and (iii) northeastern low land and Ganga plain. Since consolidation, intensity of ploughing during cropping season has increased from 3-4 times (1960-61) to 6-8 times (1980-81). Consolidation has brought considerable decrease in the cost of agricultural operations and created more opportunity for introducing modern agricultural facilities. With the development of irrigation facilities and adoption of HYV seeds, the use of chemical fertilizers has also been intensified with increased productivity.

Consequently the average caloric intake per day has increased from 1613 in 1960-61 to 1919 in 1980-81. However, the role of large size farmers (less than 10 per cent) alone has been significant in enhancing agricultural production though Green Revolution.

Consolidation of holdings is one of the important measures of land reforms, which was designed to improve agricultural productivity. Owing to consolidation not only general land use, field pattern and cropping pattern have changed but also the entire farming system has been affected.

During pre-consolidation period farming method was costly mainly due to fragmented holdings. But the consolidation has brought considerable decrease in the cost of agricultural operation. Consolidation has created more opportunity for the establishment of modern agricultural facilities. It has also increased per acre output and productivity assisted by irrigation, better manuring the HYV seeds etc.

(P. Raju)

E-8: 30

SURENDRA SINGH, "Assessment of Agricultural Manpower in the Ganga-Jamuna Doab", *Indian Journal of Landscape systems and Ecological Studies*, Vol. IX, No. 2, Dec., 1986, pp. 110-15. 3 Tables, 2 Maps.

The author negates the general trend of enumerating total persons engaged to know about the composition of agricultural workers and stresses on the need to take account of the demographic constraints like age, sex, education etc. for assessment of proper manpower index. Taking account of Ganga-Jamuna doab the author has assessed the "real" unit of manpower. After giving a brief account of physio-climatic built up of the region a detail analysis of the area considering three important demographic determinants, age, sex and mental health (educational aspects) of the agricultural workers, and converting total agricultural workers population into an index of manpower by assigning their weight, a composite index of total manpower units of each of the tehsil of Ganga-Jamuna doab have been calculated. The study of demographic coefficient and their weighted agricultural population has been worked out on the basis of recommended data of average dietary intake by Indian Council of Medical Research (1981). The findings have been presented in a nice tabular form. For assessing relative performance of rural mental-health level literacy has been considered. The relative performance of each unit as the index of

mental-health (Imh) has been calculated to obtain ratio between the percentage of educated persons and literates to total rural population (re) and its regional average (Re) as: $Imhi = (rei/Re)$. The author has finally multiplied all the three weighted indices of determinants components to get "Determinants weights". The areal variation of the components have been taken account of and presented in the form of maps. For analysis of distributional characteristics of the area units have been classified into five categories and their areal viability for each index has been depicted by preparing distributional map. The main findings show that the composite index is highly influenced by Imh index of regional tendencies of determinants weights are similar to Imh except in central parts of doab. The general trends of agricultural manpower intensity seems to decrease from upper doab towards its lower parts. The study is supplimented by good cartographic work.

(Afzal Raza Khan)

E-9: 31

CHANDRAKANT T. PAWAR AND S.D. SHINDE, "Irrigation in Maharashtra: Spatio-temporal Perspective", *The National Geographical Journal of India*, Vol. XXXII, No. 2, 1986, pp. 105-10. 1 Map, 1 Diagram.

The present study aims to highlight the spatio-temporal development of different sources of irrigation. An attempt is also made to evaluate the intensity of irrigation, growth and regional imbalances therein. The data for 1951-55 and 1976-81 has been taken for the study. The quin-quennial averages for different aspects have been mapped at district levels. The intensity of irrigation is calculated as percentage of net area irrigated to net area sown; whereas its growth is computed by considering 1951 as a base year.

Wells are the leading sources of irrigation in the state occupying about 54 per cent of the total irrigated area in the state. The canal irrigation occupies about 22.59 per cent of the total irrigated area. The tank irrigation occupies only 15 per cent of net area irrigated. Percolation tanks, lift irrigation account for a small percentage of the total irrigated area. The intensity of irrigation as of now in the state as a whole is about 11.5 per cent which was only 4 per cent during 1950-51. The intensity of irrigation and the types of irrigation differ in the different regions of the state.

The analysis reveals that Maharashtra is characterised by physiographic variations which in turn have resulted in the

dominance of particular source of irrigation in particular region. As such, the Deccan plateau has a dominance of well irrigation, the eastern parts including Chandrapur, Gadchaitoli and Bhandara districts are endowed with tank irrigated, whereas lift irrigation is widespread in south-western part of the state. The canal irrigation is developed only along the lower parts of major river basins. Presently about 11.5 per cent of net area sown is irrigated which is not even half of the national average of 27.8 per cent. However, regional imbalances within the state are at once recognised. Relatively better intensity of irrigation is observed in western upland districts, the moderate status is noted in the central drier parts, whereas poor intensity of irrigation is noted in Konkan and western parts of Vidharbha.

(P. Raju)

E-9: 32

D.K. SUJAN AND A. DIMRI, "Agricultural Broadcast: Impact, Needs and Problems Amongst Farmers", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, pp. 187-91. 1 Table.

Communication is the foremost and unavoidable need of the time and is the backbone of all developmental activities. The message of the paper is to provide effective, and purposeful communication network because people are illiterate, traditional, and ignorant about scientific developments. In this context, the paper has two objectives: (i) to find out the impact of radio broadcast in terms of gains in knowledge about wheat cultivation, and (ii) to study the needs and problems of the farmers. The study was conducted in four randomly selected villages of Block Rudrapur in Nainital district. One hundred and fifty farmers were interviewed as a sample. In order to find out the nature of change in terms of knowledge about wheat cultivation, data has been collected before and after the broadcast. The study finds that the knowledge about the wheat cultivation before broadcast was 27.22 per cent which increased upto 33.65 per cent only. More specifically the gains in knowledge due to radio broadcast about production technology, chemical fertilisers, plant protection measures, improved implements and cropping pattern was 8.29, 3.98, 7.15, 2.12 and 10.50 per cent points respectively. The authors concluded that the radio broadcast may be useful to the farmers only when the messages are in local language, timely and problem based.

(R.B. Singh)

E-9: 33

HARI SHANKER GUPTA, "Relation Between Cropped Area and Irrigation in Madhya Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 12-15. 2 Tables.

This paper is an effort to examine whether there exists any interrelationship between the area cropped and the area irrigated. Assessment of the significance of elasticity is made by taking into account the quantitative and qualitative aspects.

The paper is summarily divided into three parts - introduction, methodology and conclusion. The first part deals with the description of edaphic and climatic conditions of Madhya Pradesh. The importance of agriculture in the state's economy is cited and that probably is the explanation for the genesis of the study. Also, according to the author, most of the crops require intensive irrigation and thus it is 'desirable' to analyze the effect of the increase in irrigation potential on these crops.

The methodology adopted for the pursuance of the analysis, figures in the second section. Correlation coefficient were calculated for paddy, wheat, sugarcane and cotton. Also, equations have been formulated regarding the relation between area and irrigated area.

Conclusion states that there is little relationship between irrigation and cropped area for the given period (1950-51 - 1975-76). Among the crops only cotton has shown highly significant relationship.

The reasons given by the author for taking up a study of this kind are inadequate. The interpretation of the results obtained is too brief to put forth a clear picture. For instance, it has been stated that due to low rainfall there is a tendency to change over to irrigation dependent crops with assured means of irrigation. But at the same time there is a low positive relationship between the cropped area and irrigated area. This is not explained fully by under utilization.

(Shikha Sharma)

E-9: 34

NANDINI CHATTERJEE, "Impact of Irrigation on Agriculture in Southern West Bengal" *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 73-81. 3 Tables.

This paper attempts at making an in-depth study of the impact of irrigation on the use of land, cropping pattern and crop yields of southern West Bengal.

Paradoxically, though West Bengal lies in a humid region, the farm lands require irrigation due to unequal spatial and seasonal distribution of rainfall. The analysis is based upon the field observations of 20 villages for which data were obtained from the census of India. The impact of irrigation on land use, cropping pattern and crop yields has been quantitatively analyzed through computing the correlation coefficient.

The most important source of irrigation is groundwater formed by seepage. In recent years, however, there has been a marked change as canal irrigation has emerged as the most important. Such a predominance mainly results from comparative benefits accrued e.g. from canals rather than from tank, bundh or earthen dam irrigation. This as rightly pointed out by the author should not shadow the demerits of canal irrigation. It has been noticed, not just in the study area but also universally, that it results in water logging, percolation losses, silting and damage to standing crops.

One of the positive implications of increasing dependence on irrigation has been increase of the net sown area. In the area under study it also reduced the damage aman rice crops, hence stabilizing yields. Also poorly irrigated districts possess low cropping intensity as compared to canal irrigation tracts. Similarly, irrigation has ushered in radical changes in cropping patterns of West Bengal. A strong positive correlation exists between the gross irrigated area and the gross cropped area. It would be wise to add that the secondary determinants of cropping pattern are soil types and micro relief. Lastly, with an increase in the gross cropped area, there has been a simultaneous increase in the use of the high yielding variety of seeds thus increasing the agricultural efficiency.

(Shikha Sharma)

E-9: 35

N.Q. AMMAR, "Impact of New Technology on Agricultural Production in Aligarh District: Rasulpur Village - A Case Study", *National Geographer*, Vol. XXI, No. 2, Dec. 1986, pp. 173-78. 2 Tables, 1 Map.

In present paper, an attempt has been made to examine the role of technology in the development of agriculture in a village of Aligarh district. The author has tried to see that upto what extent the agricultural production has been affected by changed agricultural technology within a specified period of time. The study observes that with the diffusion of scientific agricultural technology, the present agricultural practice has gradually replaced the traditional method of agriculture. The number of iron plough in 1974-75 was 10960 which rose to 120590 in 1984-85 giving an increase of 1000 per cent. The increase in seed-drill was recorded 618 per cent. In 1974-75, the number of tractors and threshers increased by 165 per cent and 197 per cent respectively. The use of chemical fertilizers has increased to 120 per cent in these areas. All the inputs are contributing much towards increased agricultural production in the district. The production of rice has increased by 83 per cent and that of wheat by 24 per cent. The increase in the production of potatoes and sugarcane has been the highest. On the basis of micro-level study of village Rasulpur, the author observes that the increased irrigation facility and agricultural innovations resulted in the increase of double and triple-cropped land raising the efficiency of the fields by 300 per cent. In the year 1984-85 about 90 per cent of the total cropped area was under double-crop and 48 per cent area was under triple-crop. The study concluded that the increased use of modern farm implements, H.Y.V. of seed, irrigation facilities and chemical fertilisers and the nearness of the village to the city are responsible for the maximum agricultural output in the district.

(R.B. Singh)

E-10: 36

ABHA LAKSHMI SINGH AND FAROOQUE-AZAM, "Correlation of Irrigation and Crop Output in Western Uttar Pradesh", *The National Geographical Journal of India*, Vol. XXXII, No. 2, 1986, pp. 93-104. 2 Tables, 3 Maps, 4 Diagrams.

An attempt has been made in this paper to study the increase in crop output vis-a-vis increase of irrigation in the thirteen districts of western Uttar Pradesh from 1960 to 1980. The study period was so chosen as to cover fully the span since the launching of IADP (1960-61), and the period 1964-65 to 1970-71. Structurally, the study area forms a part of Indo-Ganga plain and is drained by the Ganga and the Yamuna along with their tributaries. Generally the soils are alluvial. The main food crops grown are wheat, rice, barley, jowar, bajra, maize, pulses, sugarcane, oil seeds and potatoes.

Various statistical indices and analyses like, intensity of irrigation, cultivation intensity, compound growth rates of area under irrigation, changes in irrigated area, correlation coefficient, Spearman's rank correlation coefficient, and regression analysis are calculated and done to bring out the correlation between irrigation and crop output.

The study reveals that increase in irrigation is mainly due to the increase in the number of tube-wells in this region. Growth rates both in irrigated area and crop output have been higher in the period 1960-70 than during the period 1970-80. In the eleven out of the thirteen districts, there has been high positive correlation coefficient between irrigation and crop output ranging from 0.6 to 0.9. The low value of correlation (0.3) in some districts can be attributed to a shift of emphasis from agriculture to industry or to improper use of agricultural inputs. Interdependence of crop output and irrigation has been expressed by a straight line equation. In some cases the production, in the absence of irrigation comes out to be negative. The higher value of 'b' in regression analysis, in some districts as compared to others can be interpreted to suggest that it is more profitable to invest in irrigation in areas with high 'b' values. The study also reveals that there are many fluctuations in the irrigation versus production relationship. The year 1970-71 is special as far as production is concerned. This is due to the fact that 'monsoon' has been very favourable during that year..

(P. Raju)

E-10: 37

B. HEMA MALINI, "Water Budget and Crop Yields: A Case Study of Groundnut Yields in Anantapur District, A.P.", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, pp. 179-85. 3 Tables, 1 Diagram.

In this paper, an attempt has been made to understand the effect of climate over crop yields. The study also gives an idea to estimate the possible increase in yields, if water deficit conditions are reduced to different levels. A case study of groundnut yields in Anantapur district of Andhra Pradesh is taken for the present study. Anantapur district is a prominent drought-prone region, so it is most likely that water deficit conditions prevail during most part of the year in the region. The methodology and statistical techniques used in this study are adopted entirely from the work of Mather (1977). Water deficit conditions on monthly basis for all the years of study for Anantapur are computed using the water budget method of Thornthwaite (1955).

The author concluded that there is an almost continuous increase in the yield due to changing technology over a period, crop yields are highly influenced by climatic parameters. A correlation of water deficit values with deviation values of groundnut yields indicates that yield is highly dependent upon the fluctuations of water deficit conditions. The high value of correlation-coefficient (-0.98) supports the above findings. This study proves that it is possible to estimate quantitatively the increases in crop yield when supplementary irrigation is provided to reduce the water-deficit conditions. The study has significant value for planners and agricultural experts. It is particularly useful in determining the irrigation programmes.

(R.B. Singh)

F. INDUSTRIAL GEOGRAPHY

F-5: 38

C.R. PATHAK, "Industrial Development and Urbanization Process", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 147-63. 4 Tables.

In this paper, an attempt has been made to explain the linkage between the urbanisation processes and industrialization pattern in India. India's efforts for rapid economic development through agglomerated industrialisation have made the urbanisation process a mere spatial consequence. Regional locational patterns of economic activities and specialization thereof, also bring about a restructuring of the regional systems of human settlements, and any distortion in one would have a tendency to influence the other.

India's urban-industrial growth processes have taken three distinct paths: (i) port based agglomerated industrialization with strong colonial heritage that continues to attract large scale rural-urban migration, causing a lopsided metropolitan urban growth; (ii) emergence of administrative-commercial regional capitals that have some national level resources based on capital-intensive industries, their decentralized-concentrated location in favoured pocket showing symptoms of urban dispersion at a regional level; (iii) penetration of market-economy and the green revolution technology in the agricultural-rural hinterland, leading to the emergence of rural market-centres and further distorting the urban-industrial linkages.

(R.K. Mandal)

F-5: 39

ASHIS K. GHOSH, "Industrialization, Environment and Quality of Life", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 1, June, 1986, pp. 72-75.

An attempt has been made in this paper to assess the impact of industrialization on the environment in general and on the quality of life in particular. Discussing the unique nature of problem associated with India's environment, the author maintains that it is remarkably different from that of the west. The environmental pollution in India is not largely originating from industrial sources but is resultant of improper forestry practices, unplanned land use pattern, policies adopted for short-term benefits and high population density. The article also criticises the government's approach towards improving the quality of life fixed in terms of economic growth, linked with more employment, more food production and consumer goods which themselves lead to generation of industrial waste. The article also evaluates the assessment project of Department of Environment for industries in the country. The use of indicator for the environmental impact assessment is of great importance. The author opines for the selection of indicator pertaining to non-immediately visible factors along with 'immediately visible factors'. He also advises for the study of a minimum required and maximum tolerated and optimal level of influence of each environmental factor. The author advocates for use of biological indicator for environmental impact assessment. Taking help of a case study the author points out some of the lacunae involved in environmental impact studies. The author, at the close of the article also advances certain measures to check environmental degradation which, he claims, if advanced properly can check the deteriorating conditions.

(Afzal Raza Khan)

G. GEOGRAPHY OF MARKETING, TRANSPORT AND COMMUNICATIONS

G-2: 40

C.K. JAIN AND S.K. SHARMA, "Agricultural Marketing in Madhya Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 59-69. 5 Tables.

The purpose of the present paper is to analyze the distributional pattern of agricultural markets or mandis of Madhya Pradesh. Most of these mandis are referred to as regulated markets since they

provide fixed and reasonable prices to farmers. This study also aims to recognize the poorly served regions and also to establish a relation-ship of the mandis with the density of population and agricultural productivity.

The distribution of the regulated agricultural markets emerges as 'fat from uniform'. This has been calculated as density (per thousand kilometres) and as R values derived from the nearest neighbour technique. The latter helps in preventing the characteristics of 'clustering', 'approaching uniformity' and randomness etc. Proximity of the mandi, as rightly pointed out by the author, depends on the extent of transportation network, and the characteristics of the terrain. Size of the regulated mandis is determined by the population it serves, quantum of arrivals and income, the latter two having a close relationship. A wide variation is noted in the composition of arrivals. The author has discussed in detail the regional variation in composition which depict whether gram or cereals are prominent in a particular centre or not.

(Shikha Sharma)

G-2: 41

M.M. JANA, "Retail Services in the Lower Silabati Basin", *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, 4 Tables, 2 Maps.

Retail services are the tools for regional as well as functional development of an area. The present study is concerned with the distribution of retail services and behavioral pattern of the consumers in the lower Silabati basin in Medinipur district of West Bengal.

The article is divided into six sections. The first section deals with the identification of varieties of retail services. Twelve groups of services have been considered. Higher order services and specialized retail services have a positive correlation with the level of urbanization of the area. The second section describes the distribution pattern of markets in three blocks markets are categorized either on the basis of periodicity (weekly, daily etc.) or on the basis of services offered (retail, wholesale). Distribution is explained as being haphazard. Distribution of retail services is dwelt upon in the third section. The growth of a retail centre is discussed in relation to its favourable location. The next section deals with price of goods which is higher in rural markets as it depends not only on distances from the wholesale markets, but also on the mode of transport for carrying the goods to the rural markets.

Variations and peculiarities of consumers' behaviour patterns are highlighted in the fifth section. It is observed that the consumers usually avail of the lower order functions at rural markets even though the price of good is higher. On comparison it was found that majority of consumers depend on the neighbouring markets for goods due to their low purchasing power and poor transport systems. Trade area of markets are dealt with in the last section which emphasises their uneven and unequal patterns of distribution. Accessibility of the services is maximum if located at the centre.

(Shikha Sharma)

G-2: 42

R.C. TEWARI AND NAND LAL, "Rural Markets in Rae Bareilly District, Uttar Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 29-37, 4 Tables, 1 Map.

The objective of the present paper is to present a detailed analysis of the rural marketing system of Rae Bareilly district at the block level. The paper also deals with the spatial distribution of the market centres which include both the traditional (periodic) and modern (regulated) market system. The spatial distribution of the market centres in this district is found to be of a scattered and scant nature. Also, the spatial variations at block level are also noteworthy. The role of rural market centres is examined as being significant as rural service centres. More details could have been added to this.

The next section deals with spacing of market centres with respect to one another. This has been calculated following a formula by Mathur. The distribution of market centres in the study area has been examined on the basis of the 'nearest neighbourhood method'. The last section on the prevalent and needed planning process in the district. It suggests that there is an imperative need to formulate a plan for development of the market centres and the market mechanism of the district. Other suggestions include the development of transport facilities for spatial growth and structural planning of markets.

(Shikha Sharma)

G-2: 43

R.S. DIXIT, "Market Centres in Hamirpur District, U.P.", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 34-40. 1 Table, 1 Map.

This paper aims at analyzing the extent of synchronization of market centres in Hamirpur district of Uttar Pradesh. Both theoretical and empirical approaches have been applied in the case.

The paper is divided into three sections. The first section deals with the introduction to the study area which has a total of 78 market centres.

The second part is devoted to the explanation of the concept of market synchronization which is defined as the manner in which a trader synchronizes his movements to various markets over space through time. This concept is peculiar to periodic markets, which in turn are peculiar to rural areas. The third section includes the testing of the formulated hypothesis with the help of chi-square test and analysing the results obtained. The hypothesis states that the spatial distance is more or less inversely related to temporal distance. The results show that five cases are in complete accord with the hypothesis; that is, in these cases the markets which are held on the same day of the week are farther apart than those held on adjacent days. This is true as put by the author himself - "The distance in space increases with the closeness in time". For the rest of the cases, four have partial accord with the hypothesis while two have completed discord.

(Shikha Sharma)

G-2: 44

R.S. DUBE, "A Rational Approach to the Marketing of Foodgrains in Madhya Pradesh", *National Geographer*, Vol. XXI, No. 2, December, 1986, pp. 131-41. 3 Tables, 4 Maps.

An evaluation of the self-sufficiency patterns of food-grains in any region may help in highlighting the need for adoption of a rational and well-conceived plan for the marketing of foodgrains. With these objectives this paper is centred on the evaluation of self-sufficiency of foodgrains production in different districts of the Madhya Pradesh. The surplus-deficit of cereals and pulses has been estimated in the context of net annual requirement of cereals and pulses calculated from the recommended daily requirement of an average Indian (cereals 369.5 gms, pulses 68.6 gms). The deficit-

surplus situation has been estimated by calculating the difference between the amount available and the amount required. All districts of the state have been grouped into eight food divisions on the basis of administrative convenience. The surplus-deficit positions in different 'food divisions' have been calculated in order to determine their potential for export/import of cereals and pulses.

The paper concludes that Gwalior, Sagar, Bhopal, Ujjain and Chhattisgarh divisions are surplus in respect of cereals. The deficiency of cereals in Indore, Jabalpur and Rewa divisions may be satisfied by importing cereals from Ujjain and Chhattisgarh divisions. Even then the state would still have a surplus of 534.67 thousand tonnes of cereals. The deficiency of pulses in Chhattisgarh, Indore, Rewa and Bhopal divisions may be fulfilled by imports from Gwalior, Ujjain, Jabalpur and Sagar divisions. Even then deficit of about 96 thousand tonnes remain to be covered by the import from other states. The flow of foodgrains at such a large scale to such far-off areas would require an efficient network of primary, secondary and tertiary agencies. The flow of grains from the farm to the local markets may be handled by primary agencies. The surplus with the primary agencies may be transported to the divisional godowns by secondary agencies. The tertiary agencies may carry the surplus from divisional godowns to other deficit Divisional Godowns.

(R.B. Singh)

G-6: 45

K.N. CHYTANYAPANDITARABHYA, "Road Network Development of Accessibility: A case study of Mysore District", *National Geographer*, Vol. XXI, No. 2, Dec., 1986, pp. 143-51. 4 Tables, 2 Maps, 1 Diagram.

This paper is an attempt to measure the accessibility of settlements to the road network in Mysore district. After analysing validity of earlier works, the author also suggests new norms to measure accessibility and network development. The study first discusses the Nagpur Plan (1943), and Chief Engineer's Plan (1961-81), taking stock of norms provided by government for transport development. The growth of road length per 100 km² in each district of Karnataka from 1936-1978 is also presented, showing that there is a steady growth in the length of roads per 100 km² in Mysore district. It has risen from 30 km² in 1936 to 68 km² in 1978. But most of the development and increase in road length has taken place only in the category of village roads.

An accessibility map has been drawn by the author, taking 1 hour normal walking distance from the village to the nearest road is the basis. On this basis, a model is evolved as follows: $A_i = W_t$, in which A_i = Accessibility of the village i to the main road, W_t is the walking time from the i th village to the main road. Further, 't' may be assumed as a constant time factor which is equal to half an hour.

The accessibility map indicates a few patches of inaccessible areas in Kollegal, Chamarajanagar, Gundalpet, Heggadadevankote and Hunsur taluks. This is, as author claims, mainly due to the Terrain characteristics of the area. The fact that the forests occupy a major portion of the land use in these taluks itself explains the sparsely developed road network in these regions. The paper maintains that if measures are taken to develop the road network on the suggested norms, the existing network can be further utilized and the accessibility situation can be improved more systematically in Mysore district so as to cope with the growth rate in other economic sectors.

(R.B.Singh)

H. POPULATION GEOGRAPHY

H-1: 46

R.S. TRIPATHI AND J.P. VISWAKARMA, "Human Resources Development in Uttar Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 22-28. 1 Table.

The present study strives to highlight the spatial disparities in human resource development in Uttar Pradesh on the basis of important demographic attributes. The variables that have been undertaken in order to reveal the spatial disparities are: population growth, density, literacy, the proportion of non-primary workers and urbanization etc. An important variable in any study of development of human resources is the number of employed persons. This has either been left out totally on purpose or due to space constraint.

Method of study involved computation of composite indices for each district on the basis of the above-mentioned variables. The author thereafter has categorised the districts into areas of very high, high, medium, low and very low development. From this also emerges a rough correlation between the variables. That is, the areas of high development e.g. Meerut, Jhansi, Nainital, Saharanpur, Muzaffarnagar and also areas of high population

growth, density, urbanization, and the proportion of non-primary workers.

(Shikha Sharma)

H-3 : 47

SUKLA MALLICK, "Age Structure and Other Demographic Indices in Hugli District, West Bengal", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 38-48, 8 Tables, 2 Maps.

Population analysis involves various devices one of which is age structure. In the present article, the age structure index of each police station of Hugli district has been correlated with a number of variables to identify the demographic measures. To get the variation in age structure, age structure index of each police station was computed.

Since age structure is an approximation, coefficient of determination was calculated to test the degree of accuracy. The result indicates that the age-structure index is highly significant explaining more than 763 variation at 99 per cent confidence level.

The study reveals that the distribution of police stations on the age structure is very uneven. The age structure itself is an imprint of several demographic characteristics. That is, a high structure indicates preponderance of younger population and agrarian character of the region.

The author has also tried to study the relationship of eight variables with the age structure. Thus by the means of linear correlation few important relationships emerge, that is, higher the number of children per thousand females, the younger is the age structure, and inverse relationships between (a) density of population, (b) percentage of urban population, (c) percentage of literacy and age structure. Similarly, multiple correlation was made between age structure and the selected demographic measures.

(Shikha Sharma)

H-3 : 48

TARA DEVI SINGH, "The Socio-Economic Patterns of Population in Varanasi : A Traditional and Pilgrimage

City", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, pp. 48-57, 3 Tables; 2 Maps.

This paper seeks to analyse the socio-economic patterns of population in Varanasi. The city of Varanasi is supposed to be one of the oldest living city on the earth. The article starts with the histogenesis of the city to evaluate the trend and processes leading to the present morphological patterning of the city. The histogenesis analysis is also important because its the city is religio-commercial activities which have roots in the hoary past. The spatial appraisal of existing socio-economic patterns of population has been done based on the data of 1971 census. The existing dimensions of the intra-city socio-economic patterns have been assessed and analysed by factor analytical method using seventeen variables on social status, economic status and ethnicity. The processed data, with the help of relevant programme in the computer, was reduced to five significant factors. This, for Varanasi, was done by eliminating the factors with eign values less than one. The use of seventeen variables in the present case have very aptly explained the total character of city i.e., over 83 per cent of the total explained variance has been accounted by the first factor having ten variables.

The main findings of the study have been presented in a tabular form. The five factors having eign values more than one have been discussed separately. The study is also supplemented by good cartographic work. The over-emphasis on the quantitative penetration of the study which also affects the readability of the paper.

(Afzal Raza Khan)

I-SETTLEMENTS : RURAL

I-1 : 49

SUKHDEV SINGH CHIB, "Habitat and Society in Kangra and Kinnaur Districts of Himachal Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 12-19.

The present paper deals with patterns of life in the Kangra and Kinnaur districts of Himachal Pradesh. In describing the habitat and society of the area under study the author brings out the physiographic environment, economic scene and socio-cultural spectrum in different sections.

In the section on physical environment, physiographic, climatic and vegetational characteristics are put forth on a subdivisinal basis. Mention is also made of certain ecological problems, such as removal of vegetative cover, soil erosion. The occurrence of landslides in this part of the country which has recently got accelerated has not been included as a major ecological hazard. The economy of the two districts is agro-pastoral dominant. Some changes, however, and modern inputs in the region. This has resulted in breaking away from traditional vocations and seeking new job avenues.

Various statistical figures form a major portion of the section on socio-cultural spectrum. The author has well highlighted the causes underlying some of the data e.g. high sex ratio-an unusual phenomenon- in North Western India - is because of large number of males working in the armed forces and in other jobs outside the district. Other data which is available is one literacy rate, density figures, number of educational institutions. Unfortunately, sources of data have not been mentioned. The radical changes that have ensued in the cultural fabric have been enumerated within this last section.

(Shikha Sharma)

I-4 : 50

S. BHATT and H. P. BHATT, "Pinsuar, A High Altitude Village in Garhwal Himalaya", *Geographical Review of India*, Vol. XLVIII, No. 4, December, 1986, pp. 5-8.

The aim of the present paper is to discover the morphogenetic patterns of rural settlements in the Garhwal Himalayas. The study is based on a 10 per cent sample of villages of the Tehri Garhwal district. For this sample, various processes, institutional set-up, community structure, settling process etc. were studied.

Basically, the attempt is to analyze as to what extent does the ecology of the place, governs its physical and social morphology. The latter term has not, however, been defined precisely by the author and thus can be assumed to have a general connotation. In this effort, several aspects of the village are analyzed. These are : site and histogenesis, morphology and caste structure, field patterns, functional structure, house types.

Pinsuar is inhabited by Rajputs comprising from clan, and four kholas (sub castes). Discussing the social morphology, the author points out that 'there seems to be no caste considerations in choosing the palces of sub-caste sector' and further 'the village

morphology is not complex'. However, his concluding statement seems to contradict this view when he observes a marked distinction between houses of various castes, on the basis of high and low social standing. Influence of topography on the patterns of fields depict a small and holding size and no means of irrigation.

'Functional morphology' or the economy of the village is also not complex as it is agriculturally dominant. Cattle rearing is another important occupation. In a similar manner, the house types are believed to show the impact of local material and physical environment.

(Shikha Sharma)

I-5 : 51

JYOTIRMOY SEN, "Dudhia, a Newly Settled Village in Darjeeling Hills", *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 59-63, 1 Map.

The present study aims at describing the socio-economic conditions of Dudhia village which has recently come up in Darjeeling hills. The author traces the genesis of the settlement, goes on to describe its population and settlement characteristics and also discusses the economic bases of the village.

The village came into being in 1967 as a result of occupation by encroachers from Nepal and Bijanbari and Kalimpong. The Nepalese form the predominant community. The settlement pattern is compact at the market and scattered elsewhere. Regarding the age composition the author laments, Age composition shows that more females than males are born here. This is more like discussing sex ratio than age composition and hence the statement becomes quite incorrect. Surprisingly, the life expectancy of females is more than that of the males. This should have been substantiated with likely reasons. In any population, however, small, with mixed communities, a social stratification both in terms of status and occupational affiliations are noticed. In the present article this aspect has not been dwelt upon at all.

Agriculture has been noted as the mainstay of the economy of the people of Dudhia. This is accompanied by some other subsidiary occupations. However, since earlier in the article the author notes that tourist attraction is a reason for flourishing trade activities of Dudhia, the role of tourism in Dudhia's economy or at least the percentage of people dependent on it should have been mentioned.

Also, the fact that females outnumber males in the category of literates is a reflection of the social conditions of the village. Since within fifteen years of the genesis of the village, 50 per cent of the population has become literate it would certainly have some effect on the socio-economic conditions. These should have been highlighted.

(Shikha Sharma)

I-7 : 52

H. P. BHAT, 'Rural Houses in Tehri Garhwal', *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 20-27.

The purpose of the present paper is to show the characteristic features of the rural houses of the Tehri Garhwal region. The common features of houses have been observed on the basis of field survey in the district of Tehri Garhwal.

Bhatt in this article has tried to bring forth the various peculiarities of the residential quarters in the rural areas of Tehri Garhwal district. He discusses at length the general pattern of a house with its basic features which are more or less common to all the sections of the rural society, e. g. , the presence of a courtyard, a kalliyan (thrashing ground) , a chhajja (balcony), a chullah (hearth). There may be, however, certain distinctions depending on the economic status of the family. A general plan of a house (diagrammatic representation) could have been represented for easy comprehension by the reader. Diagrams are conspicuous by their absence. The strength of the existing social bonds is brought out well by the author through his description of community labour in the construction of a house.

(Shikha Sharma)

J-SETTLEMENTS : URBAN

J-1 : 53

RANA P. B. SINGH and R. L. SINGH, "Urban Changes in India", *World Patterns of Modern Urban Change*, Chicago University, Department of Geography Research Papers, Nos. 217-18, pp. 175-93.

During the census period of 1901-1981, the urban changes have been analysed with reference to number of urban centres, urban population, per cent share and decadal variation. The highest

growth (46.01 per cent) was noticed during 1971-81 which was caused by several pull factors. Further the size-class of urban places and population has been described for the period of 1961-81 in reference to number, per cent share and decadal variation. It has been observed that the urban agglomerations are increasing rapidly; their numbers was only one in 1901 which reached to 12 in 1981. Additionally nine more cities will be included among the million plus urban agglomeration by 1991, thus totalling to 21. But the regional pattern records contrasting situation. According to an estimate for the spatial pattern, it is expected that by A.D. 2001 the western, eastern and Bengal coastal area will be the most urbanized and in the continent. These spatial patterns have correspondence with several social problems like crime, congestion and the like.

(R. B. Singh)

J-2 : 54

AMAR SINGH, "Urban Accretion versus Urbanization : A Case Study of the National Capital Region, India", *Spectrum of Modern Geograph*, (New Delhi : Concept, 1986), pp. 181-89, 2 Maps.

In this paper, an attempt has been made to find the basis for the justification of increasing population of the National Capital Region which the author describes as the process of urban accretion urbanization, in the real sense, means an expansion of non-agricultural, especially, secondary activities which constitutes a step forward in economic development. Urban accretion, on the other hand, is merely the result of the social, political and economic attraction of the cities.

As regards the distribution of population among the urban centres of the National Capital Region, the most outstanding characteristic is the excessive hypertrophy of Delhi metropolis, which claims 65.89 per cent to the total urban population of the region, leaving 34.11 per cent of the remaining 60 towns. The class I towns alone account for 78.90 per cent of the total urban population, whereas the class VI towns have only 2.33 per cent. The analysis further reveals the eccentric nature of the distribution of urban population among cities and towns. The distribution of cities and towns shows that spacing of towns is closer in U.P. sub-region than in other sub-regions of the region.

The spatial organisation of urban settlements reveals that high order towns (e. g. Delhi, Meerut and Ghaziabad) are closely spaced. For proper spatial organisation, such high order centres should be

more widely spaced than the lower order ones. It is, therefore, clear that the National Capital Region lacks a proper organization of space through a network of hierarchy of nodes and sub-nodes.

(R. K. Madal)

J-2 : 55

B. K. ROY, "Recent Urbanisation in India : A Scenario", *The National Geographical Journal of India*, Vol. XXXII, No. 1, 1986, pp. 17-29, 6 Tables, 3 Maps.

Urbanisation depends largely on the development of industrialisation, infrastructure within cities, towns and their neighbourhood. Demographers, economists, statisticians and geographers define urbanisation with specific views and tools in several ways. A vast literature accordingly is evaluation of urbanisation in the country. This paper in particular focuses urban situations and urbanisation intertwining various faces of the country, being based primarily on census data and supported to some extent by other studies and government documents.

This paper attempts to project urbanisation levels and patterns in India mainly according to census data of 1981 by three measuring standpoints : (1) at all-India perspective keeping districts and urban centres in view, a delineation of urbanisation index (UI) using different size classes of towns from I to VI and population of the respective towns, (ii) reconstituting information on morphogenesis of Lucknow as case, studying the pattern of landscape change due to urban spread during 1971-81, (iii) by a case study of Standard Urban Area of Gulbarga (Karnataka), a view is presented giving the probable input in future urbanisation in the county. Besides, in the paper, specific mention of class I urban areas are referred to with emphasis on the million cities regarding the growth and pattern. Accordingly, four levels of urbanisation are identified.

(P. Raju)

J-3 : 56

MAYA BANERJEE AND RANJIT KUMAR BANERJEE, "Growth of Burla and Hirakud Towns in Orissa", *Geographical Review of India*, Vol. XLVIII, No. 4, December, 1986, pp. 51-60, 2 Tables, 2 Maps.

The introduction of several River Dam and Valley Projects has led to drastic changes in the regions of their location. The first to be

affected are of course the original inhabitants of the place. There is not only an outflow of migrants from the area, but also an inflow of people from other places. This beacuse, the presence of a dam, diversifies and strengthens the economy of the place which serves as a pull factor for the surrounding population. Thus emerge towns in the vicinity of the dam.

The present study is an attempt to trace the growth of Burla and Hirakud towns which are a driect outcome of the Hirakud Dam Project. The growth and origin of these two towns have been portrayed in the perspective of economic development. The paper is divided into two major sections dealing with twon's physiographic setting and growth respectively. Though both the towns have same genesis, functionally they are quite different. Burla town functions as a service centre and Hirakud as an industiral one. A common feature in both the towns is an increasing rate of population growth which was in accordance with the development of the townships. Burla, however, is in a rudimentary condition from urban point of view as characteristic urbaism is still lacking. A marked feature is well-planned residential area and absence of haphazard growth. Commerical areas, educational and other institutions signify the urban character of the area. Hirakud is different in various respects. A polytechnic institute, an aluminium factory are the most imjpotant features of the town.

(Shikha Sharma)

J-3 : 57

R. L. DWIVEDI, "A Comparative Study of Evolution and Demographic Character of Kaval Towns of Uttar Pradesh", *Spectrum of Modern Geography*, (New Delhi : Concept, 1986), pp. 10-112, 6 Tables.

The objective of this paper is to make a comparative study of the origin, growth and demographic character of the five most important cities of the Ganga plain of Uttar Pradesh. The KAVAl towns (Kanpur, Agra, Varanasi, Allahabad and Lucknow), the five larges cities of Uttar Pradesh dominate the urban landscape of this part of the Ganga valley. The high bluffs, meander loops and confluence forks of rivers were, therefore, selected as favourable sites with obious adavatages. Cutural factors too played important roles in the origin of these towns. Strategically located forts on large rivers attracted urban communities to settle down in their immediate vicinity. In the modern period, industrialization and new transportation routes, particularly the railways, have been contributing factors in the evolution of these urban centres.

During 1901-81, while the population of Kanpur has increased by more than 800 per cent, that of Lucknow and Agra rose only by a little more than 400 per cent. Varanasi and Allahabad have registered an increase of less than 400 per cent during the same period.

In the occupational structure of the five cities it is most striking to find the preponderance of non-worker. From the perusal of the percentage figures it may be stated that Varanasi and Kanpur employ larger percentage of total workers in industry, Agra and Varanasi in trade; Agra and Lucknow in transport; and Allahabad and Lucknow in services, essentially in administrative services. Varanasi is the home of household industry whereas Kanpur is the biggest centre of large-scale industries, Lucknow being the state capital and Allahabad enjoying the status of a secondary capital, have been able to provide a large number of people in government and other offices.

(R. K. Mandal)

J-4: 58

ASHOK K.DUTT AND RUHUL AMIN, "Towards a Typology of South Asian Cities", *The National Geographical Journal of India*, Vol. XXXII, No. 1, 1986, pp. 30-39. 1 Table, 3 Diagrams.

The study offers a typology of South Asian cities with special reference to India in the context of their history, technological association, political and economic status and cultural roots with a view to characterising the city forms more comprehensively and in a dynamic perspective. A typology of South Asian cities illustrates three basic models - transitional bazaar, colonial and planned. A mixed model combining features of Bazaar, colonial and planned cities emanates from the interaction among or between them. Each of the models has different sub-categories. They have been listed with one example for each; commercial (Biharsharif), transport (Siliguri), temple (Puri), and administrative (Lucknow) cities with reference to their distinct features and functional characters. The colonial cities include the 3 presidency towns (Calcutta, Bombay and Madras), hill-stations (Simla, Darjeeling and Ootacamund), cantonment towns (Secunderabad, Barrackpore, and Danapuri) and railway colonies (Kharagpur and Mugalsarai). The planned cities represent pre-colonial (Mohenjodaro and Pataliputra, colonial (New

Delhi) and post-colonial (Chandigarh and Bhubaneswar) periods with their unique characteristics.

The mixed city model includes three broad sub-categories; mixture of bazaar, colonial and planned models with bazaar type dominating; mixture with colonial pattern governing; mixture with planned features predominant. Each of these broad mixed categories are further sub-divided into 3 sub-types with varying combinations. The typology is all inclusive and all encompassing. For a more clear understanding of the typology, three basic models given in the paper are further elaborated and illustrated.

As is evident from the typology and the related examples, perhaps no sizable South Asian city can be designated exclusively as bazaar, colonial or planned types, rather each model has made imprints on the other. The typology presented in this paper provides a comprehensive understanding of the nature and characteristics of South Asian cities. In preparing the city plans for south Asia or any other realm of the Third World it is necessary to understand the related typological framework in a dynamic perspective, so that, the existing forms may be understood in a functional appropriateness and necessary adjustment can be made for their preservation, modification or elimination.

(P. Raju)

L-4: 59

SATYESH CHAKRABORTY, "Region for Planning: Some Issues", *Annals of the NAGI*, Vol. VI, No. 2, 1986, pp. 39-48.

The aim of this paper as stated by the author, is to discern the utility of the method of regionalization for purposes of planning. The author starts with the assumption that the concept of region is relatively well worked out in the academy. However, its application to planning in India is not extensively known. The author feels that it is necessary for both the planners and regional analysts to see how the art of regionalization can be gainfully used in planning. A number of issues have been raised which appear to be important at this stage of developing link between planning and regionalization. For example, planners should know as to why regions are delineated; what is the nature of objectivity that a delineated region represents; and how can these be used for planning purposes.

The author answers these questions in the following way: (i) one may thus observe that the delineation of region provides

locational preferences for directing planned actions; (ii) regional analysts tell us that there exist three kinds of regions, viz., the naive regions (example: Bengali's conception of Brihat Banga or Greater Bengal); instituted regions (example: nations, states, districts, tehsils, villages); and denoted regions (example all regions identified by application of art of regionalization). (iii) Regions do not represent objective realities, especially to those who define objects by their dimensional attributes only, they represent interpreted reality. (iv) Regionalization may help in planning if it is done in the context of the four phases of work involved in the planning process. They are (a) identifying needs, (b) desirable programmes of action, (c) quantum of resources available, and (d) monitoring of projects under evaluation.

(Nasim Aijaz)

J-5: 60

SMITA SENGUPTA, "Demarcation of the Residential Suburbs of Ahmedabad City", *The National Geographical Journal of India*, Vol. XXXII, No. 1, 1986, pp: 49-60. 3 Tables, 3 Maps, 1 Diagram.

The main objective of this paper is to demarcate the suburban zone with reference to residential suburbs of Ahmedabad. The growth of Ahmedabad city till late 19th century was concentrated in its eastern part. Due to the construction of bridges over the Sabarmati river, chiefly residential colonies started expanding to the west of the river while industrial and commercial zones are mainly on the eastern side of the river.

This paper focusses on the suburbs of the new residential area of Ahmedabad situated in the western side of the river Sabarmati. A classification of suburbs of residential area of Ahmedabad city has been made in reference to 23 maujas. With the help of many variables like distance of core villages of these maujas from the nearest point on municipal boundary, distance of the nearest mauja boundary from the core of the city, number of registered housing societies (1976), number of bus routes (1976), frequency of bus routes (1976), percentage of growth of population (1961-71), density of population per km² in 1971 and percentage of non-agricultural workers to total workers in 1971.

Calculating the mean and standard deviation and with the help of weighted averages for each of the variables an index i.e., Suburbanisation Index (SI) has been drawn to demarcate the

suburbs, using all these variables. By using graphically the mean and the distance from the city limit, four main subdivisions have been made based on the concept of distance-decay: (1) Urban suburbs; (2) Moderately urban suburbs; (3) Moderately rural suburbs; and (4) Rural suburbs.

(P. Raju)

J-6: 61

ABHA SINGH, "Agricultural Population in the Urban Centres of Varanasi City Region A Geographical Analysis", *The National Geographical Journal of India*, Vol. XXXII, No. 1, 1986, pp. 40-48. 2 Tables, 6 Diagrams.

This paper is an attempt to discuss the nature, role and importance of the activities relating to agriculture (both the cultivators as well as agricultural labourers) in the urban centres of Varanasi city-region. The city-region covers a total area of 24,097.5 Km² and comprises four districts of eastern Uttar Pradesh i.e., Ballia, Ghazipur, Azamgarh and Jaunpur (except Machhalisher tahsil) together with the block of Akhandnagar (Sultanpur district) and two tehsils (Robertsganj and Chunar) of Mirzapur district. All the 61 urban centres of the demarcated region are taken for this study. Various demographic characteristics of urban workers are analysed in detail. To put it briefly, the present geographical analysis seeks to analyse the character of agricultural occupational structure of the urban centres of the Varanasi city region taking into account all the related socio-economic and spatial facts over a certain period.

A statistical analysis has been made to find out the nature of the degree of relationship between the percentage of workers engaged in agriculture and its principal correlates like working population percentage, scheduled caste and scheduled tribe population percentage, literacy percentage, and sex ratio.

The total working population as well as the literate population are inversely related with the agricultural population, the percentage of explained variance being 3.6 and 12.3 respectively. Other important factors are the Scheduled Castes and Scheduled Tribe population as well as the sex ratio, the percentage of explained variance being 5.76 and 67.2 respectively. The problem of labour surplus is an inbuilt feature of the traditional farming in the urban centres of the Varanasi city region. The increasing transport facilities, social securities and the mechanisation of agricultural practices have not only caused better yields but also have created a

number of new types of technical jobs in the urban centres, and thus help saving the present day unemployment problem.

(P. Raju)

J-6: 62

N.B.K. REDDY AND M.V. PRABHU, "The Components and Characteristics of Cities and Towns of Tamil Nadu", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 165-79. 10 Tables.

An attempt has been made in this paper to evaluate the characteristics of cities and towns of Tamil Nadu based on 33 variables using principal component analysis. The result of this study indicate that there are in fact but a few basic ways in which cities vary. The large number of characteristics that may be collected for each town show high degree of intercorrelation, indicating that whole groups of variables give exactly the same information about the towns. Each group of characteristics, in effect, behave like the multiple symptoms of a more fundamental 'syndrome' or 'dimension' of variation.

The five principal components could be discerned representing 23 variables out of a total of 33 variables selected for the purpose of the present analysis. In order of importance based on the dimensions of the characteristics of the urban settlements of Tamil Nadu the following are listed - (i) components of amenities and demographic size, (ii) components of tertiary activity, (iii) component of secondary activity, (iv) component of density or compactness, and, (v) components of houses, and households.

Broadly speaking, the tertiary activity and urban amenities have been shown to exert a profound differentiating influence on the urban settlements of Tamil Nadu. The primary activity which carried negative loading also differentiates the urban settlement on the basis of the strength of rural setting. The secondary activity is no doubt significant in the process of urbanization, but its role is only third in importance. In most of the urban settlements the density of population and houses as well as houses and households per 1000 population are high, since most of the urban settlements are very crowded. Hence, as a differentiating factor they play a relatively less important role when compared with urban amenities, tertiary and secondary activities.

(R.K. Mandal)

J-7: 63

GAUTAM MALICK, "The Concept of the Urban Fringe in India", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp.75-78.

The growth of urban fringe is an important contemporary issue. It is especially so in India where metropolitan expansion is taking place at an accelerating rate. Such peripheral expansion results into a region which is variously known as 'umland', 'fringe', 'Urban area' etc.

Though a fringe may be found ubiquitously in both the developed and developing world, yet the characteristics of this region differ vastly in these two types of countries. An attempt has been made here to study some of the aspects of the urban fringe in India, a developing country where the conditions of urban fringe as noticed in the developed countries do not fully exist.

The author in this paper deals with the 'fringe growth' rather than the concept as the title of the paper would lead one to think. In discussing the fringe growth the viewpoints of various authors have been quoted, e.g., Carter, Nangia, Gupta, Das, Lahiri. The studies mentioned bring out a common feature of big cities in developing countries being parasitic in nature. However, Carter's observation that these cities do not serve to generate economic progress in the countryside is a generalisation and may well be debatable. This is so because in India, as the city expands the living conditions may deteriorate and economy decline at first instance, but it, in most cases, progresses as the urban functions are pursued by the local population.

(Shikha Sharma)

J-8: 64

R.C.S. TARAGI AND KRISHNA KUMAR, "Hierarchical Levels of Class I Cities and Urban Agglomerations in India", *Geographical Review of India*, Vol. XLVIII, No. 2, March, 1986, pp. 27-31. 1 Table, 1 Map, 2 Diagrams.

There is a vast range of population size in the cities and urban agglomerations. Also, diversities are noticeable in the status and specialization of these centres. In the present article an attempt has been made to rearrange them in an hierarchical order based on size of working population in the secondary and tertiary sector.

The 218 urban centres which have been classified as class I cities or urban agglomerations have been taken into account by the author. The aim of the paper is to determine the hierarchy of urban centres above 100,000 population mark so that they can be distinguished from each other on the basis of their size and their service providing capacity. For this, 2 indices - the centrality index and size index - are calculated for each urban centre. The results thus obtained show strong positive relationship between the centrality and the size of urban centres. The centres are graded into four levels of hierarchy.

(Shikha Sharma)

J-8: 65

SAYEED AHMAD KHAN, "Hierarchical Classification of Service Centres", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 49-54. 2 Tables

One of the problems often faced in urban studies is that of assigning hierarchical rank to a service centre on a central place. Many methods of classifying centres according to their functional status have been suggested by geographers and other academicians. The purpose of the present paper is to analyze the five such most important techniques by applying them to the service centres of the Trans-Ghaghra Plain and comparing the results obtained.

The study has taken into account of 237 service centres. Five methods of hierarchical classification have been critically discussed viz. Grove and Hussar's, Godlund's Ullman's, Berry and Garrison's and Davis's. The section on methodology constitutes the discussion of the five methods and their critical evaluation. This points out some of the inherent difficulties which one would come across through the usage of these methods.

In the section, the author presents his study of Trans-Ghaghra plain and shows the results obtained in the exercise of establishing a hierarchy of service centres under different methods of classification. It is noted that the number of centres for the first and second class is the same in all the methods but differences emerge as one goes down the continuum.

There are difficulties regarding the analysis of the functional structure of centres within a class. For this purpose, the author rejects all except Davis's method for which the author advances some arguments.

For an overall method the author suggests Davis's method of hierarchical classification as the most suitable technique. But this is debatable too, because it has its own drawbacks which are inherent.

(Shikha Sharma)

J-10: 66

S.L. KAYASTHA AND V.K. KUMAR, "Quality of Human Environment: A Case Study of Kanpur City", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 447-59. 3 Tables, 2 Maps.

In this paper an attempt has been made to analyse the quality of environment of Kanpur, where several factors such as air, water and noise pollution and unsatisfactory garbage disposal and sewerage systems have made the environment very uncongenial.

Old industrial establishments, and unauthorized colonies lack even the basic requirements of sanitation. There has been an unprecedented growth in migration from rural to urban areas. The central part of the city, covering mostly old settlements, has a density of more than 60,000 persons/km². According to the Master Plan, the present rate of growth would require more than 200,000 dwelling units. On one hand the city today can boast a number of sky scrapers in posh colonies with high rental value, while on the other hand many a family has to be contented with a single room with common sanitation facilities.

Dense smoke and toxic gases, covering the city especially during the winter months, have resulted in the occurrence of smog. This has resulted in all kinds of respiratory diseases. Vegetation has also been affected by dust particles emitted from industries and thermal power plants.

(R.K. Mandal)

L. REGIONALISATION, REGIONAL DEVELOPMENT PLANNING

L-3: 67

MANIDIPA BASU MALLIK, "Integrated Development Pattern in Darjeeling Himalayan Region", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 1, June, 1986, pp.64-71. 2 Tables, 1 Diagram.

In this paper an attempt has been made to analyse the role of factors such as physiography, climate, and socio-economic set-up within the broader framework of integrated development of Darjeeling region. The study mainly focuses on the nature of changes recorded in the field of socio-economic development resources and land use patterns. In rationale for evaluating such changes lies in a better understanding of trend of changes to pronosticate future to have a better and more suitable planning for mitigating regional imbalances and using resource potentials optimally. The above objective is fulfilled with the study of physical resource-base. The Darjeeling Himalayan region has about 38.23 per cent area under forest cover and the author discusses the economic potentialities of the forest wood. The region is rich in terms of water resources on these are innumerable streams which provide good scope for generation of hydroelectricity. The region despite not being as rich as South Bihar in terms of minerals has enough which could be exploited economically. The cultural set-up of the region in terms of agriculture, industry and tourism has been discussed. The region is diverse providing scope for many varieties of cultivation including production of best varieties of oranges in the country. Economically speaking, however, it is tea plantation which is also supported by ideal climate and physiographic conditions. The Darjeeling district does not have many large-scale industries. The main problem enumerated by the author for this region includes physiographic ruggedness and environmental constraints, etc. The author, quite in keeping with the norms of the system approach, calls for the need for a holistic approach to make this region useful to the fullest extent. The conclusion of the article suggests some measures for optimal use of resources like water, mineral, agriculture and scenic beauty.

(Afzal Raza Khan)

L-4: 68

SUNIL KUMAR MUNSI, "Enclaves and Growth Poles: Some Observations on the India Situation", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 335-43.

In this paper an attempt has been made to understand the spatial organisation of Indian economy as it had emerged around the port-based metropolises of the country. These were the centres or areas of 'growth' where economic activities were controlled and conducted solely or almost entirely for the colonial interests.

The author is of the opinion that the growth poles of today have some resemblance with the 'enclaves' of yesterday. The

termination of colonial regime brought about a significant change in so far as it altered the roles of subordination and domination and of the 'enclaves'. But, the basic ideology persisted. The ideology that view individuals endowed with potentials as the motive force of development, of sending out impulses to be felt all over, as Watt had commented about the tea plantations. The net result has been the deepening of regional imbalances between the 'developed' and the 'backward' regions.

The tea gardens of Bengal, Assam, and the Nilgiris, the mining areas of Bihar, Orissa and Bengal could be taken as typical examples of such enclave development with varying degrees of significance. Irrigation was another area of major British investment. The irrigated area of Punjab, Sind and Madras bear characteristics akin to enclavization.

(R.K. Mandal)

L-4: 69

S.C. CHAKRABORTY, "On Decentralized Regional Planning in India", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 275-94.

This paper aims at the importance of decentralized regional planning as an alternative approach to centralized planning in India. Decentralized planning is a technique that recognizes the need for decentralized decision-making process for location-allocation of socio-economic infrastructure and opportunities. This requires, in the opinion of the authors, creation of multiple organisations of planning, each having a distinct territorial jurisdiction or domain of action.

On the one hand, obvious differences exist in the social base of technology - between the cities and the villages, and between industry and agriculture. On the other hand, there exists a complex system of interdependence between the metropolitan cities in India, based as it is upon an equally complex system of interdependence between different types of industries. The city based industries are mainly producing a large array of goods that are meaningful primarily to the urban economy in India. These industries hardly produce any goods for the rural economy to improve its productivity status. Thus it has been seen that a purely centralized mechanism of planning in India has brought about enormous disparities in the levels of development of regions.

The spatial variation of the socio-cultural base in our country appears as a constraining factor in obtaining optimal mobility of labour. Ours is a multi-ethnic, multireligious and multi-lingual society which pose a number of social structural problems in the country.

The point to consider, therefore, is not whether to take a stand exclusively for decentralized regional planning against centralized national planning. There is need to strive for a place for smaller arfeas within the national planning map in such a manner so that the strength and identity of the regions are maintained at the same time a national purpose and perspective of development is obtained.

(R.K. Mandal)

L-4: 70

S.P. CHATTERJEE, "National Planning: A Geographical Approach", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, pp. 1-4.

The author attempts to discuss the geographical approach in National Planning in the light of rapid population growth and increasing dependency on agriculture. The utility of geography in national planning was more felt after the second World War and geography obtained the status of an applied science. India, expected to be the largest country in terms of population by 2020, has to depend primarily on its own resource-base. India unfortunately has not been able to develop its factory based industries and most of its population is still dependent on land and natural resources which is in a much bad shape. The lack and nature of technological diffusion has made the scene worse. A detailed survey of land resources in these conditions is a must to have a clear picture and conception of relevant planning strategy. Making reference of some Soviet regions the author quotes as to how geographers can contribute in this direction. The author while discussing the national planning also presents the major landuses of the country in a succicent and weid form. The author maintains tht the organized industries do not play a large part in the life of the people of major parts of the country. To author the national planning means a conscious effort of people to change his environment in the best of the national interest and it calls for the planners to be equipped with accurate knowledge of hstorical growth and cultural factors etc. However, the role of the economist in national planning is not underestimated, but geography can certainly help the economist to keep his feet firm on the earth.

(Afzal Raza Khan)

L-5: 71

DIRK BONGER, "Regional Disparities as a Problem of Spatial Development Planning in Countries of the Third World - Case of India with reference to Andhra Pradesh", *Annals, National Association of Geographers, India*, Vol. VI, No. 1, 1986, pp. 14-37. 5 Tables, 3 Maps.

The paper reviews the policies and measures taken in the past by Government towards removing regional imbalances in India. After a discussion on concepts relating to development, a methodology is proposed and qualitative techniques applied to identify levels of regional development in Andhra Pradesh. Possible directions to reduce regional imbalances are indicated.

The existence of pronounced regional disparities in economic, social and cultural aspects within the Third World countries lead to the co-existence of quite a number of different stages or levels of development. Using a very limited number of indicators, e.g. per capita income, the studies carried out so far focussed on regional disparities with the state as a unit of study.

Out of the large number of theoretically possible indicators for characterising the level of development, 30 for all-India and 36 indicators for Andhra Pradesh have been taken into consideration within the frame of this study. These indicators are classified into 6 and 9 hierarchical dimensions and are further summarised into 4 and 5 complexes respectively. The intermediate administrative level, i.e., the district is used as the regional unit in this analysis. In order to get a qualitative measure of the (30 and 36) development factors or indicators as well as the possibility to compare the levels of development of particularly districts, the data were transformed into a scoring system: the maximum obtainable score for a development factor will be 100 points and the score for the lower data has been proportionately computed.

From this analysis in the state of Andhra Pradesh two 'core regions' have emerged: Hyderabad Urban Agglomeration, and Delta region (Guntur, Krishna, West and East Godavari districts). Some more 'active areas' and 'passive areas' are identified. The spatial picture of level of development of different regions offers an important decision basis for the regional planning procedure. The findings give the possibility to determine out of the total number of regions preferably to be developed (target regions), the final selection of the 'action regions'.

(P. Raju)

L-5: 72

MEHDI RAZA AND FARKHUNEDA BURKE, "Regional Dimensions of Income Disparities: A Case study of Uttar Pradesh, India", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 227-41. 4 Tables, 1 Map, 2 Diagrams.

The present study aims at drawing attention of the reader to the regional variations in the distribution of per capita income in the state of Uttar Pradesh. The authors have also tried to identifying the factors responsible for the marked spatial disparity therein which on turn has been linked with policy formulations and remedial measures.

The average per capita income of U.P. for 1970-71 at current prices was Rs. 336/-. Only twenty districts had per-capita income above the state average, the remaining twenty eight districts, mainly concentrated in eastern Uttar Pradesh had per-capita income levels below the state average. Eastern Uttar Pradesh is characterised by predominantly marginal and sub-marginal holdings. They are being further fragmented under the pressure of growing population.

Nainital is one of the districts with the smallest percentage of landholdings below one hectare (36.34%), therefore, the output per-worker is comparatively high. The level of urbanization also is relatively high.

Some measures have been suggested in order to remove the malaise of poverty in this region. Some form of collectivization seems to be the answer in the long-run, which seems mostly feasible in the opinion of the authors. As a short-term measure, the modification of Indian Inheritance Law has been suggested so that further fragmentation of land subsequent to consolidation may be prevented. These measures coupled with a proper implimentation of ceiling and tenancy laws may, to a certain extent, ameliorate the dismal situation.

Minimizing the gap between rural and urban areas and reconstructing rural society to ensure self-sufficiency, the author suggest that by providing employment during the lean periods or by proper implementation of the food-for-work programme the gravity of the situation can be mitigated to a large extent.

(R.K. Mandal)

O. PHILOSOPHY OF GEOGRAPHY

O-2: 73

C.D. DESHPANDE, "Towards a Gandhian Geography: A Preliminary Essay", *Spectrum of Modern Geography*, (New Delhi: Concept, 1986), pp. 19-26.

In this paper an attempt has been made to understand geography within the framework of Gandhian philosophy. The Gandhian principle of *ahimsa* connotes several ideas that are important in understanding the man-environment relationships. First of all it implies that man is a part of the larger ecosystem and must play a role that is proper to his wisdom and understanding. In doing so he must live with minimum needs without causing a heavy strain on his environment and thereby degrading it. He should enrich the environment through the thoughtful use of soil and domestic animals.

The approach in such a study is radically different from the one we adopt today in settlement and landuse studies. We generally tend to begin a geographical enquiry with the families - their needs, their economic condition, level of skills and abilities for achieving better results, and the local resources that are available. It should be possible to construct an input-output model within the economic framework of the village and its resources, progressively generating models in which external inputs are introduced in a phased manner, and observe their impact. Studies in environmental perception should help us in our understanding of the structural barriers between caste groups which can be significantly weakened with the help of systematic and conscious policy inferences. Innovations, barriers to their acceptance and adoption, offer a fruitful field for promoting production and distribution as well as social cohesion. This could be within the parameters of Gandhian philosophy and Gandhiji himself did not rule out modern technology if it were truly to serve the Indian villages.

(R.K. Mandal)

P. ENVIRONMENTAL STUDIES

P-2: 74

ARUN KUMAR SINGH, "The Changing Environment in the Nilgiri Hills", *Geographical Review of India*, Vol. XLVIII, No. 4, December, 1986, pp. 28-31. 2 Tables.

The paper evaluates the problem of changing environment in the Nilgiris. Land degradation resulting from deforestation has emerged as a burning issue these days. The problem is acute in the hills where deforestation even on a small scale results in terrific soil erosion owing much to the already sloping lands.

The present paper focuses attention towards an area in the Nilgiri Hills which was covered by tropical forest, two centuries ago. Now it has been cleared, without any inhibitions, to accommodate the plantation agriculture. The crops being introduced are tea, coffee and cinchona.

The area under study is Gudalur taluk, an undulating land with annual rainfall as high as 2000 mm. It forms an important ecological unit being rich not only in evergreen forests but also a wide range of wild flora and fauna. The stability in the environment has been disturbed and deforestation and land encroachment have become general problems.

Prior to the transition period, the tribal population was engaged in shifting agriculture and food gathering. These occupations were the mainstay of their economy. In the past few decades however, tribes have taken to settled agriculture. As a result of this some villages have almost 100 per cent of their land under plantation.

(Shikha Sharma)

P-3: 74

R.P. MISRA AND H.N. MISRA, "Human Survival and Development: Focus on Land, Water and Minerals", *Annals of NAGI*, Vol. VI, No. 2, 1986, pp. 21-38. 8 Tables.

In this paper an attempt has been made to highlight the importance of natural resources such as land, water and mineral resources to human kind in their survival on this planet. The authors have posed this problem in the context of the impending ecological crisis. Citing examples from 24 countries the authors have assessed India's position in the natural resource endowments including land, water and minerals. The study ends with reflections on science and technology education.

The paper has been divided into six sections. Section 1 deals with an understanding of the nature of the problem in view of the increasing pressure of population on natural endowments, disparities in international economic development and technological and scientific advances giving immense power to

man to make indiscriminate use of these natural resources. In section II the authors deal with land resources, particularly with the physical suitability of land, social accessibility, impact of land reforms, problems of urban land use planning. In section III problems such as water resources of the world, hydrological cycle and world's water balance, future demands and water resource planning have been discussed. Mineral resources and their mode of occurrence, their world reserves and production and the impact of the mining activity on the ecosystem have been discussed in section IV. Section V deals with issues pertaining to the use and misuse of these natural resources. Section VI evaluates the role of science and technology education to alleviate the problems of ecological imbalance and the challenges of the resource constraints which the human kind has been facing and future generations are likely to face.

It is unfortunate that no reference has been made to the existing mode of capitalist exploitation of world's resources which poses the single major threat to the world ecosystem and the human survival on this planet.

(Nasim Aijaz)

P-3: 75

M. MUKHOPADHYAY, "Utilization of Aquatic Resources of Purulia District, West Bengal", *Geographical Review of India*, Vol. XXVIII, No. 4, December, 1986, pp. 32-35.

Though Purulia is delineated as a backward and drought-prone district it still has immense scope to boost-up its economy with proper utilization and management of aquatic resources. In the present study the author has made an analysis of the existing geographical aspects of aquatic resources. Amongst others, the aquatic resources has been neglected for long.

The aquatic resources are found to be an important substitute for livelihood in the poorer sections of the rural community. Amongst the aquatic resources, fish farming is most important in Purulia district. Besides its high nutritive value, fish provides employment opportunities to a large number of people.

Tanks, locally known as bandhs, tiny reservoirs behind the jhor bandhs, large reservoirs behind dams, etc. are ideal sites for fish farming. The rivers in this district, being flashy and torrential during the rainy season and dry in other months, are not of particular use in the culture of fish. Out of an estimated area of 30,000 hectares covered by tanks and bandhs in Purulia district

about half is found to be ideal for pisciculture on a commercial scale. An important function of pisciculture in this district is sprawn production mainly by private agencies and by the government fishery department.

The aquatic resources of Purulia district are hindered in their steady growth by various factors: (a) acute illiteracy of rural population is an obstacle to the introduction of new methods for commercial culture; (b) physical constraints - low rainfall, hot weather, permeable regolith; (c) poor socio-economic structure and poor infrastructural facilities, (d) multiple ownership of tanks is an obstacle to commercial exploitation; (e) use of fertilizers for water treatment is very restricted.

In conclusion, the author suggests some measures for the optimum utilisation of the aquatic resources of Purulia district.

(Anjali Gusain)

P-4: 76

K. BAGCHI, "Ecodevelopmental Features of the Ganga Basin, A Case Study in West Bengal", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 1-14. 4 Tables, 4 Maps.

The present article is the Presidential address delivered at the annual meeting of the Geographical Society of India. The aim is to focus on the ecodevelopmental features of the Ganga Basin in West Bengal. The emerging environmental problems of the area have been linked with a variety of features. For instance, pollution is depicted as an effect of the flow characteristics and sedimentation of the river Hughli. It is validly noted that since the flow of the river is sluggish, the process of removal of the pollutants is slow and difficult.

Results of an extensive field work by research unit bring out the clear association between population and pollution. The mounting demographic pressure indicates heavy human load both in terms of settlement and industries.

Study conducted on the nature of urban waste load, projects heavily polluted zones is injurious to health but also pollutes the river extensively. Similarly, the problem of industrial waste water is equally hazardous in this industrial belt. The major causes of the problem are the chemical industries which are increasing everyday in reflection of the demand imposed. Their waste products

which are washed down into the river have become a matter of serious concern. The effect on fisheries was also studied. A comprehensive note on the bio-chemical oxygen demand accompanies the text. All of the above have resulted in high incidences of diseases related to acute air and water pollution. Lastly, the effect of intensive land use which has resulted in a high consumption of fertilizers is evoked upon as of serious consequences to health as well as to aquatic life.

(Shikha Sharma)

P-4: 77

R.L. SINGH, "Ecological Processes of Rural Habitat Transformation in India", *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 1-11.

The present paper is a revised version of Prof. N.K. Bose Memorial Lecture delivered at the 73rd Science Congress. The author here deals with 'the ecology of human habitat transformation' with emphasis on the dynamics of processes and structures. Rural habitat system is seen as undergoing change in keeping with the structural development and functioning of "geonomic system".

The article firstly deals with ecodevelopment as a form of planned growth applicable to the Third World with a large rural base. The application to the Third World with a large rural base. The application of ecodevelopment approach to the rural areas has been advocated as it concerned mainly with the development of the locally available resources thus supporting human life quality. This way not only is the process of development ensued but it also brings about effective management of the even deteriorating ecosystems.

Secondly, it is observed that a check on degradation of rural habitat can be brought about by the scheme of rural habitat transformation. Such a degradation is caused by urban processes of erosion in rural areas and can be stopped if urban expansion is systematised.

Thirdly, in rural areas, appropriate technologies involving low cost are to be considered as the basic strategy for development. Also stress should be on increasing production through proper land and water management. Thus role of transmission of low cost technologies for the utilization of rural energy resources can bring about habitat transformation. Fourthly, tribal development is to constitute a major component of the plan. Finally, a strategy for development is chalked out with three dimensions - socio-economic, environmental and behavioral.

(Shikha Sharma)

P-5: 78

D.N. SINGH AND S.C. RAI, "Urban Environment of Varanasi City: An Analysis of Some Basic Problems and Suggestive Measures", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, pp. 38-44. 4 Tables, 2 Maps.

In this paper an attempt has been made to assess the problems of urban environment of Varanasi city, and suggest some measures to improve it. Considering the agents of pollution the study of environmental problems have been done for the Varanasi city. It is supported by empirical and first hand information by the authors. The major pollutants taken into account are related to air, water, noise and disposal of solid waste etc. The discussion starts with a succinct introduction of the city and is followed by a study of the population characteristics. The growth of population has led to great pressure on the resources and congestion has led to severe environmental degradations. The population density is varied in different wards which is also manifested in the varied intensity of environmental problem. The main cause of great population pressure as mentioned by the author is the religio-commercial status of the city. This attracts great 'floating population' worsening the situation of the city. The great vehicular traffic maladjusted with the density of roads has led as air and noise pollution. The pollutant to air is also supplied from burning of wood, coal and dry dung in the city. The noise is at its peak during festivals causing great damage to environment. The authors also mention the 1985 survey on health hazards and mention a few diseases common in the city. The problems, many a times, are concerned with poor water management leading to water pollution, potable water lack, bad drainage and sewerage etc. The quality of environment is also affected by disposal of solid waste which itself is a reflection of dietary habits, type of economic activity and standard living etc. Poor management of city municipal council responsible for solid-waste disposal has further aggravated the situation. Considering the nature of problem the study also suggests eight measures to check the deteriorating environmental quality of the city.

(Afzal Raza Khan)

P-6: 79

A.B. MUKERJI, "Landslides and Man: Development and Destruction in Western Himalaya", *Spectrum of Modern Geography* (New Delhi: Concept, 1986), pp. 397-428. 14 Tables, 2 Maps, 8 Diagrams.

The objectives of the paper are two-fold: (i) to analyse the regional and temporal patterns of landslides and avalanches, and (ii) to identify the human dimensions associated with them.

Developmental activities accompanied by landslides have two dimensions, spatial and temporal. Accordingly landslides also have these two distributional components. Spatially, the landslides and the human casualties and property damage caused by them are concentrated in the post-1967 period of the post-independence era.

Slate, shale, limestone and orthoquartzite, particularly in the zone of crushing along the faults, comprise the lithological factors. The steep slopes, mainly a function of the original structural dips, provide a conducive topographic setting. High intensity and high amount of rainfall and snowfall complete the list of natural-causal factors of landslides.

Removal of forests, development of urban mesh, and elaboration of transportation network have been the principal human correlates. Man, through his imprudent operation has caused extensive damage to the ecological settings and distortions in the arrangement of ecological conditions. The damage and the distortions retard the development processes. Development thus becomes counter-productive to both man and nature.

There is hardly any part in the Himalaya which is not standing at the thresholds of destruction because of the conspiracy being continually hatched against it by the combined role of lithology, topography and precipitation among the natural factors, and their relationship with the patterns and activities of human occupancy.

(R.K. Mandal)

Q. GEOMORPHOLOGY

Q-2: 80

R.K. PANDE AND D.S. RAWAT, "Characterization of Channel Network Structure in Crystalline and Granite Rock Groups of Almora Nappe", *National Geographer*, Vol. XXI, No. 1, June, 1986, pp. 101-6. 1 Table, 1 Map, 2 Diagrams.

This paper highlights the morphometric variable of the Kosi-Suyal catchment in Almora district. The analysis reveals the profound effect of bedrock lithologies in the channel network characterization. The study is based on ten sample channel networks selected on the basis of Survey of India topographical maps and field-work. To assess the degree of significance of the dimensionless indices in explaining the network character, profiles has been drawn, justifying the role of bedrock lithology in characterizing the channel networks. This has been supplemented by the use of advanced quantitative techniques. Considering few orthogonal coordinates in a 3-dimensional space, the location of each basin in the space under the euclidian distance framework has been estimated. Forty-five distances between ten sample networks have been calculated which have been used as the measures of similarity or dissimilarity among the basins. Linking the networks with each other at their minimum distance level, the authors observe dendrogram which confirms the clearcut existence of two sets of clusters which once again reveals the impact of geological conditions in morphometric characterization of the networks.

The paper concludes that bedrock lithology of the basins have a significant control over the morphometric personalities of the networks. Morphometric environments of both the rock groups are entirely different from each other, resulting into two clusters. Finally, different morphometric personality of crystalline rocks in comparison with that of the granite suggests the existence of Karbala fault just south of Almora town. In the west, from Karbala, a layer of granite rocks is extended from the Kosi river, in the north to the Suyal river.

(R.B. Singh)

Q-2: 81

S.C. SINGH AND A.K. SHANDILYA, "Slope Mapping in the Garhwal Himalaya, Uttar Pradesh", *Geographical Review of India*, Vol. XLVIII, No. 3, December, 1986, pp. 55-58. 1 Map.

Slope mapping was carried out in the Northern part of Srinagar in Garhwal Himalayas. The area is delimited by the North Almora Thrust on the south and Main Central Thrust on the north. The rock formations belong to the crystalline group, Calcareous group in the central part and Chandpur group in the south. The slope analysis was carried out in order to analyse the development of land forms in this area, and to determine the possible effects of thrusting upon these slopes. Slope measurements were made in the

field at different points and their angles and directions of inclinations were plotted.

The slopes have been categorised in the following types: vertical slope, concave slope, convex slope, straight slope or rectilinear slope and composite slope. The vertical slope is, generally, developed along the zones of tectonic dislocations, in some deeply drowed river gorges and on the escarpment from along the rock massifs in the Chirpatayakhal area and in the Badiargad area, etc. Concave slope is developed as a result of the depositional processes. The lower part of the talus slope may develop a less steep angle on deposition of some sediments down the slope. The convex slope profile is developed generally on the upper part of the slope, and hence, the term 'summital convexity' is widely used. Rectilinear slope profiles display a marked straight outline which may vary a good deal in its dimensions, sometimes dominating the entire slope. Composite slope is, generally, a combination in one actual profile of two or more of these simpler elements, namely, convex, rectilinear, concave and vertical slope types.

The study concludes that as the slopes are, generally, of cliff type in the entire area, composed of cohesive material, such slopes are convex on the top, straight in the middle, and concave towards the bottom.

(Anjali Gusain)

Q-3: 82

A.K. SINGH, "Characteristics of Silt Deposition in the Kosi River Basin", *National Geographer*, Vol. XXI, No. 1, June, 1986, pp. 107-15. 3 Tables, 1 Map, 3 Diagrams.

In this paper, an attempt has been made to present a lucid exposition of silt character so that future plans may be prepared to control the devastations caused by massive sedimentation. For achieving this aim, Kosi river basin has been taken for empirical study. Kosi with its built propensities is a crucial problem to the engineers as well as decision-makers. The author is of the opinion that the bedslope and sandy rocks of the river course is a crucial factor in causing land degradation and silt concentration. The slope not only induces rapid erosion on hill slopes but also allows the river to carry sand and silt down the hills for levelling the trough of lowland in the plain. For the purpose of analysing the skewness of the silt discharge the data of silt concentration from 1968 to 1981 have been standardised by the formula of Pearson type III distribution. The author concluded that the concentration of coarse silt was only 27.51 per cent of the total sediment yield in 1972 but

some increase to 79.18 per cent in 1973. The maximum amount of sediment yield (94.72 per cent) is obtained from June to September. Whereas for the remaining parts of the year it is very nominal (5.17%), largely due to seasonal regimes of the rainfall. The skewness of silt discharge is very low, i.e., -0.0000011 which indicates that the amount of silt deposition is more or less uniform in different years. The quantity and quality of load are greatly influenced by the geological and climatic factors. The study further indicated that the Kosi silt deposition is shifting towards west. After some years reaching the western embankment its westward shift would be retarded.

(R.B. Singh)

Q-3: 83

S.K. VISHWAS AND S.N. RAJAGURU, "A Parametric Approach to Terrain Analysis and Geomorphologic Regionalisation of Pravara River Basin (Maharashtra)", *Journal of Geological Society of India*, Vol. XXVII, No. 4, 1986, pp. 369-78. 3 Tables, 1 Map, 2 Diagrams.

Terrain analysis, to delineate the geomorphic regions in terms of the general form of the landscape as expressed by relief is usually done either by parametric approach or landscape approach. The various landscape units (regions) of drainage basins are, by and large, identified and demarcated based on morphometric analysis which is nothing but landscape approach, with almost conventional devotion by many geomorphological. The present study uses a parametric approach for basin (terrain) classification (analysis) and regionalisation. A detailed micro-level statistical analysis has brought out the spatial variation in the terrain of Pravara and Mula sub-basins of the Godavari river at its higher reaches in Western Maharashtra. A number of geomorphic variables like, relief, slope, drainage and three other related variables were synthesized to a single comprehensive pattern for basin classification and regionalisation. Statistical methods like bi-variate and multi-variate and regression analyses in relation to Principal Component Analysis and Factor Analysis were used. The six variables selected for various analyses are: absolute relief, relative relief, mean slope, source density, drainage density and stream frequency. The data is evolved from the basic information extracted from the toposheets. For these variables, Principal Component Analysis (PCA) has aided in establishing three groups of interrelated variables, and the Factor Analysis (FA) has been able to synthesize patterns labelled as 'Morphogenetic Regions'. The analyses have brought out a very good degree of association

between the drainage and relief attributes. Finally, the basin is divided into five geomorphic regions, viz., dominantly dissected regions, highly dissected region, moderately dissected region and slightly dissected region and very less dissected region. The multivariate analysis has been able to derive equations of high predictive and descriptive value. Such an approach to terrain analysis has been found to be very fruitful than the conventional morphometric analysis.

(P. Raju)

Q-3: 84

S. BASU AND L. GHATOWAR, "Long Profiles of the Lower Courses of the Lish and the Gish Rivers", *Geographical Review of India*, Vol. XLVIII, No. 3, September, 1986, pp. 79-83. 1 Map.

In order to understand the channel forms and associated progress, an attempt has been made here to bring out the characteristic features of the long profiles of the Lower Lish and the Gish rivers (Darjeeling district of West Bengal). Both the rivers display a typical braided pattern. The total discharge of both the rivers varies from a negligible amount of about two cu. mts. per second in the dry season to 1994 cy. mts. per second in the rainy season. The catchments of these rivers are small. The average annual rainfall in these hilly catchments is very delicately built, being composed mainly of semi-crushed phyllite of Darjeeling Series. Instead of being treated with the amount of care that was its due the area was subjected to the utmost maltreatment under the Khas-mahel tenure, and the inevitable occurred. Soil erosion has been heavy and some of the slips that formed, increased in dimension from year to year and are still very active. The Lish and the Gish rivers, being on the plains, are incompetent to cope with such enormous amount of debris received from the upper reaches and the river beds are thus gradually elevated. This debris containing boulders, some several tonnes in weight, and the uprooted trees sometimes chokes the principal waterways which eventually lead to the spilling of water across human habitations and cultivated fields. The road and railway bridges spanning these rivers at the foot of the hills as well as the embankments below the lines of communication act as dams across these streams, so that the effect of spilling is multiplied manifold. Thus, by raising the bed regularly from year to year, the rivers get deteriorated and the balance between the process of erosion and deposition is never maintained, pointing to upgraded profiles.

(Anjali Gusain)

Q-3: 85

SAVINDRA SINGH, V. GARDINER AND S.S. OJHA, "Spatial Variation of Drainage Density in the Palamau Uplands, India", *National Geographer*, Vol. XXI, No. 1, June, 1986, pp. 83-99. 4 Tables, 1 Map, 3 Diagrams.

This paper deals with the spatial variation of drainage density in the Palamau uplands. The authors attempt to develop a technique of drainage density in terms of drainage texture and propose a hypothesis concerning relationships between drainage density and relief aspects of the drainage basin. Further topological methods have been developed from the Carlston and Langbein approach. An index of drainage texture has been worked out in the present study in addition to drainage density. Nineteen basins of 6th Strahler order and 10 of the 5th order were selected from the network, covering nearly 4800 km² (half of the total area). The nature of both spatial and statistical variation of drainage density is also given in a more rigorous fashion by percentage curves indicating area occupied by drainage density classes for each of the basins.

This has been further supplemented by analysis of morphometric variables. Ten morphometric indices expressing mainly density of drainage and slope aspects of the 29 basins were examined by principal components analysis of the product-moment correlation matrix amongst the variables. The authors conclude that rock type, climate, vegetation and soil type all interact to produce drainage densities characteristics of the four physiographic regions present in the area. Tertiary tectonic uplift is also an important factor in determining drainage density. The spatial variation in drainage density supports the Abraham's Model (1980) in which the relationship between drainage density and slope attributes of the drainage basin is dependent upon the mode of run-off generating attributes. Thus this depends upon the environmental components of the region. In this way, the paper helps to measure land form classification for evaluation of land and water resource management.

(R.B. Singh)

Q-4: 86

H.S. SHARMA, "The Study of Planation Surfaces of Rajasthan", *National Geographer*, Vol. XXI, No. 1, June, 1986, pp. 67-81. 3 Maps, 5 Diagrams.

This paper makes an attempt to analyse the complex nature of various planation surfaces of Rajasthan. After reviewing the works done by geologists and geographers during 1950 and 1980, the study maintains that by and large planation surfaces are surfaces of erosion, the agent more often being fluvial and less marine and plateaux. It is now realized that some of the surfaces are the results of deposition by different agents as well. In the absence of any fossils in the pre-lambrian rock system of Rajasthan it has become very difficult to date the various planer surfaces. For the quantitative expression of various planer surfaces, various morphometric techniques have been used. The morphometric analysis identified four planer surfaces, i.e. (i) planer surface above 600 mts. to 900 mts., (ii) planer surface 400 mts. to 500 mts. (iii) planer surface 300 mts. to 400 mts., and (iv) planer surface 180 mts. to 300 mts. The author indicates that the topography of Rajasthan is multicyclic and concludes that the Aravalli range appears to have been peneplained during the Mesozoic era at sometime not very much earlier than the cretaceous. The upwarping of the Aravallis revived erosion and partial stripping produced high level iselbergs of Mt. Abu and its surrounding areas. Lesser period of extensive weathering during post-Eocene period is evidenced by lateritic deposits on Deccan trap of Kota, Jhalawar and Chittorgarh regions. Renewed erosion during tertiary began to make a new erosion surface of the Mewar plateau. The formation of the fourth planer surface has been controlled by alternate wet and dry phases of climatic and neotectonism during the quaternary period. The merit of the paper lies with fact that the analysis of landsat imageries and aerial photographs is substantiated with extensive field observations.

(R.B. Singh)

Q-6: 87

A.K. PAUL AND M.K. BANDYOPADHYAY, "Coastal Sand Dunes of Sagar Island, West Bengal", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 41-48. 3 Tables, 1 Map, 2 Diagrams.

Cyclic changes of the coastal dunes are studied in a bare sand flat of the deltaic island (Sagar Island) of the Hugli (Ganga). The southern coastal tract of the island is marked by the location of sand dunes, sand flats, salt marshes and wide sandy beaches with some clay patches near the mouth of the Hugli and the Bratala channel. The deformation and changes of the dunes through a cyclic order occur in response to the differential direction and velocity of wind, availability of subsurface moisture, role of vegetation and distribution of finer sediments of the flat. The south-west monsoon winds with frequent cyclonic velocity change the sharpness of the

barkhans and minimize the development of undulations of the flat. The presence of high subsurface moisture initiate the development of halophytic plants in the sand flat which resist the wind energy to deform the flat sands.

Barkhans with gentle windward slope and steep leeward slope are formed in the dry months by the unidirectional strong wind on the bare sand flat. Coastal sand dunes are normally not fully dedveloped in the humid tropics due to the differential direction and low energy of wind. Moreover, dunes are not thickly vegretated and stabilised in the tropical coasts because of high temperature, high salinity, insufficient moisture and the frequent activities of storm tidal acions.

The bare sand flats are developed in the deltaic low coasts of tropical West Bengal which are unstable and change with the seasonal weather cycle. The growth of dunes is hampered due to grazing of animals on the sand flats and dunes. The dry finer particles of the bare flat are transported to a distance by the activities of wind and thus the flats are extended inland. Major changes occur during the months of March, June and October.

(Anjali Gusain)

Q-7: 88

MATTHIAS KUHLE, "The Upper Limit of Glaciation in the Hīmalayas", *Geo-Journal*, Vol. XIII, No. 2, December, 1986, pp. 331-46. 2 Tables, 4 Diagrams, 6 Photographs.

On the slopes of Himalayan mountains there is a reduction and culmination of glaciation at 7000-7200 m asl. The presumed cause for this is that the surface temperatures on these slopes are too low for glaciation. This working hypothesis was verified with temperature measurements using collected infra-red radiation. This regression analysis of the measurements taken in the Mt. Everest region during sunny weather conditions of the post-monsoon season resulted in a 0°C line at 7000-7200 m asl. The coincidence of the 0°C with the upper limit of glaciation is casually definable with the relationship between the function of temperature and snow metamorphism: since it is too cold above 7000-7200 m. asl., metamorphism into perennial or glacial ice through settling or sintering is absent or simply too slow. High relief and drifting hinder here the processes of ice-formation through pressure compaction of the dry-snow accumulation caused by molecular diffusion and recrystallization. Above 7200 m. only continuous leeward accumulations of shifting snow on wall sections with

moderate inclination lead to the formation of seracs. However, glaciation generally ceases at this level. This additionally confirms another study. It has been proven that Himalayan glaciers with catchment areas over 7000 m. do not extend further downward than those glaciers whose catchment areas just reach this altitude. A break in balance at 7100 m. asl is thereby confirmed, and the upper glacial limit is proven. Above the glacial region a rocky zone adjoins with pergelid conditions even in the surface layer. This zone is covered by snow during monsoon season only. Here, the weathering processes take place in an arid environment without thawing and purely by means of temperature variations below 0°C .

(Anjali Gusain)

S. CLIMATOLOGY

S-5: 89

D.V. BHASKAR RAO AND S.A. HAKEEM, "Prediction of Monsoon Depression Movement with Barotropic Models", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 28-33. 1 Table.

Though a few limited studies are available, there has been a need for improving the prediction of the movement of monsoon depressions. In the present study an attempt has been made to examine the performance of both the filtered and primitive equations of the barotropic models in the study of the behaviour of the monsoon depression during its formative, mature and dissipative stages. The study consists of prediction, starting with the initial positional data at different stages during the life cycle of the depression.

The surface synoptic charts from the 6th to the 11th of August 1979 show the presence of a monsoon depression formed at the head of the Bay of Bengal on the 6th of August and moving wsestnorthwestwards finally dissipating by the 10th of August. The 500 millibar analysed charts for the period from 6th to 11th of August have been used to obtain the grid point values of the wind and geopotential fields. The data has been divided into three subsets, each with three days duration which starts from the 6th, the 7th and the 8th of August, separately. Predictions have been obtained upto 72 hours with the three sets to study the model behaviour in predicting the movement of the monsoon depression during its different phases.

The results obtained indicate that the prediction is reasonably correct upto 48 hours when the depression is fully formed. The predictions go erroneous during the dissipative stage. The absence of the physical processes like condensation, vertical motion, radiation, etc., in the models is one of the main causes for the error. The movement of the monsoon depression is better predicted when the system is mature and maintaining its intensity. Both the filtered and primitive equation barotropic models give reasonably good predictions upto 36 to 48 hours.

(Anjali Gusain)

S-5: 90

K.N. MUKHERJEE, "Genesis of the Indian Monsoon, Relationship with Forests and Desert", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 2, December, 1986, pp. 58-65. 2 Maps

This paper seeks to analyse the genesis of the Indian Monsoon and its relationship with the vegetation and desert. The present study also touches upon some of the much debatable factors like the factors influencing rainfall, bearing of vegetation on rainfall, desert and its relationship with rainfall, the tribal population and their role in rain-fall variability and also the major belief that rainfall, if seen not much fluctuation is there.

The correlation between thick forest and good rainfall is not a mere association. The plantation which has developed much in the form of ritual as observed by different government bodies and voluntary organizations as "Vana Mahotsva" is much like an eye-wash as most of the trees (about 75 per cent) die after plantation. The author points out that the answer to drought conditions does not lie in the natural but anthropogenic factors. Citing some examples from west the author mentions that the role of forest for the rainfall is not more than negligible - "the rainfall makes forest and forest alone cannot cause rainfall". The author also mentions the conditions in Archean era to prove that how the belief held in several quarters of scientists that there is no relationship in the development of monsoon mechanism with desert is erroneous. The Himalayan orogeny is also discussed in the article to further the idea. The author has also elaborated the idea on to how the joint effect of the Himalayas and the desert caused the genesis and gradual maturity of monsoon system. The author at the end of the study has remarked that anthropogenic factors have great bearing -

usually indirectly - on the vagaries and genesis of monsoon and advices to have harmonious adjustment with it lest add to one's own misery.

(Afzal Raza Khan)

S-5: 91

A.R. SUBRAMANIAM AND P.A. NARASIMHA RAJU, "Droughts in North Coastal Andhra - A Climatic Study", *Annals of the National Association of Geographers, India*, Vol. VI, No. 1, 1986, pp. 9-13. 2 Tables, 3 Diagrams.

North coastal Andhra, as a region lies in the north-eastern portion of the Andhra Pradesh state. This region comprises three districts - Srikakulam, Vizianagaram and Visakhapatnam. It suffers from droughts frequently in its plain areas. The average rainfall in the plains of these districts of this region varies from 1000 to 1200 mm. This region has humid climate in its western hilly part. The coastal tract (plains) and the central plains between coastal plains and the hills have semi-arid and dry sub-humid types of climate respectively. Drought is studied here in terms of moisture deficiency or in other words in terms of moisture available in the soil and its effect on plant growth. Eight stations in the region have been taken to study the frequency and occurrence of droughts with different intensities (moderate, large, severe, and disastrous) during the period 1920-1979. Water budget or water balance method of Thornthwaite and Mather (1955) which is quantitative has been employed to study the droughts. Aridity Index (Ia), the ratio of mean annual water deficit to mean annual water need is used for establishing and classifying droughts. The Aridity Index calculated here proved to be a better alternative to other statistical measures employed by various authors in the past for drought studies. It is observed that the percentage chance of occurrence of drought is maximum at Kalingapatnam (56.6 per cent), Sompeta (55.5 per cent) Jai and Vijanagram (55.1 per cent). Decennial frequency of droughts, to have a clear understanding of the drought occurrence at different locations (stations), are also presented in this paper.

(P. Raju)

T. SOIL GEOGRAPHY

T: 92

SWAPNA BASU, 'Soil Erosion in the Upper Damodar Valley', *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 79-85. 2 Tables, 4 Maps.

The above article deals with soil erosion problem in the sub-catchment of the Dagdagia Nala, in the Balumath sub-division of Palamau district of Bihar. The study is an attempt at focussing on the perennial and much talked about problem of soil erosion in the upper Damodar Valley region. The author has tried to assess the degree of soil degradation which is a menace to the ecological balance of the area.

The article comprises three district sections. In the first section the general characteristics of the area under study are outlined. The emphasis here is largely on the land cover pattern under which five major units of land in the region are elaborated upon. These are (1) forest, (2) cultivated land, (3) Taur uplands, (4) unproductive lands. For each category the predominant type of soil erosion is highlighted.

The causes of soil erosion are broadly enumerated in section two. These are mismanagement of forests, overgrazing, forest fires, Taur cultivation and physical conditions of the soil. In the last section a model land use plan has been presented after examining the land capability and productivity of the study area.

(Shikha Sharma)

T: 93

S.C. SHARMA, *Tarai Soils of Eastern Uttar Pradesh, Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 16-26. 1 Map.

The paper attempts to analyse, geographically, the soils of the tarai tract of Eastern Uttar Pradesh, which extends in a narrow and elongated strip of land along the Indo-Nepal border between 27°8'N to 28°19'N parallels and 81°4'E to 84°2'E meridians and covers an area of 9109 square kilometres. Originally, the tarai covered much wider a zone extending 80 to 90 kilometres, but much of this has been altered by settlement that the true tarai is now confined to a relatively narrow strip running parallel to the bhabar.

Structurally, the tarai forms essentially a part of the vast Ganga plain, which has been produced by the Pleistocene and Sub-recent alluvial deposition which commenced after the final upheaval of the Himalayas. The region is marked by a high water table (3 to 4 metres).

The soils of the tarai tract differ strikingly from those found in other parts of India. Viewed geologically, the soils of the region may be said to be of sub-recent alluvial formation having a substantial proportion of undecomposed plant residue. In other words, mostly, they are immature and youthful, possessing high moisture in the subsoil, high clay content and high fertility. These features together with the climatic and biotic factors give these soils a rather homogeneous character and make it a difficult task to attempt a proper classification of them. However, topography, which affects soil morphology, easily serves as a criterion for this purpose. On this basis, a soil classification has been attempted and the characteristics of each type have been briefly discussed.

(Anjali Gusain)

T: 94

G.B. SINGH AND K.S. SOHAL, Soil Rating Zones of Punjab, *Geographical Review of India*, Vol. XLVIII, No. 1, March, 1986, pp. 46-51. 1 Table, 1 Map.

H.E. Storie (1950) was the first to determine the soil productivity index on scientific lines which he termed 'Soil Rating Index'. In this formulation he considered factors like soil profile, texture of the soil, slope, etc. Storie Index was later applied by Shome and Raychaudhuri (1960) for evaluating the rating of Indian soils. However, they introduced a slight modification and took into account three principal characteristics of the soils, namely (a) character of the soil profile, (b) topography and texture, (c) degree of climatic suitability, salinity, stoniness and tendency to erode. The results, thus obtained, were found to be significant. In the present paper, the authors have attempted to formulate soil rating zones of Punjab by using the above technique in a slightly modified form which brings out two important elements of agricultural productivity. First, it determines the productivity rating indices which are defined as the capacity of the soil to produce crops and, secondly, it emphasises the comparative suitability and productivity of various soils for the most suitable crops at the present technological levels.

The result obtained has been used to divide the state of Punjab into four index zones. The very high index zone or the zone of the most fertile soils, having a rating of more than 80% is confined to Ludhiana district alone. The high index zone has fairly rich soils with rating varying between 75 and 80% and extends over the districts of Patiala, Ferozpur, Amritsar and Gurdaspur. The moderately rich soil zone with rating index varying from 70 to 75% has two clear-cut belts. The first consists of Bhatinda, Faridkot and Sangrur districts. The second belt comprises of major parts of Bist

Doab region. The low index zone with soil ratings between 65 and 75% includes the districts of Hoshiarpur, Ropar and Pathankot tehsil of Gurdaspur district.

(Anjali Gusain)

T: 95

PARTHA BASU, "Laterites of Midnaipur and Their Morphology", *Geographical Review of India*, Vol. XLVIII, No. 2, June, 1986, pp. 57-62.

Some of the laterite tracts of Midnaipur have been studied here. As the lateritic terrains of Midnaipur district have been exposed to rapid subaerial denudation, the normal soil profiles are not usually found in most of the places. The laterite profiles mostly include an upper hard crust and a mottled zone below. The pallid zone has not been found in any of the profiles. The lateritic areas of Midnaipur district are characterised by flat surfaces. If considered at a micro-level, these may be taken to represent plantation surfaces. The present paper, however, deals mainly with the micro-level, these may be taken to represent plantation surfaces. The present paper, however, deals mainly with the micro-level landform features of the lateritic area of Midnaipur district in West Bengal. These features have been formed as a result of interaction between the present-day geomorphic processes and laterite horizons. The lateritic micro-level landforms may be of relevance to planning of an optimum utilization of the barren lateritic terrains of the country. This paper includes a study of the lateritic soil profiles at Kharagpur, Chilkigarh, Kurchibani and Tenga. The development of micro-lateritic landforms has also been studied at different localities.

The typical landform features which have evolved through the interaction between the laterite and active geomorphic processes have been identified.

The laterite terrains of Midnaipur district mostly lie barren, without much of agriculture on them. Wherever the indusated laterite crust appears on the surface, it has been barren for years together. As such, laterite soils are acidic, with low humus content and usually cannot retain much water. Laterite blocks are being used for constructional purposes.

(Anjali Gusain)

U. BIOGEOGRAPHY

U-2: 96

B.C. MAZUMDAR, "Studies of Kumaon Forest in Naini Tal Area", *Indian Journal of Landscape Systems and Ecological Studies*, Vol. IX, No. 1, June, 1986, pp. 52-54. 2 Tables.

In this paper an attempt has been made to analyse the situation of forests cover of Nainital district in these days. The area of this region based on altitude is classified as Mountainous region (above 1500'), Bhabar region (500-1500') and Tarai region. The forest of Nainital district has been divided into four separate forest divisions. The discussion of the scenic beauty of the forest and species of trees have been done by Dr. Mazumdar. In a table of author quite systematically presents the different species of trees and areas occupied by them. A separate discussion of wild life of the forest has also been done. The region has a rich number of species as one can see in the table containing names of different types of animals and their species. The discussion more or less focuses that there is variation in flora and fauna in keeping with the difference in altitude. The last section of the article is devoted to the study of problems faced by the forest in Kumaon hills. However, the discussion is quite succinct and mentions only three out of several problems. Flash flood during monsoon has become a great threat to forest and this problem is further aggravated by deforestation. Forest fires and biotic pressures are two other problems encountered in the region and need to be solved quickly to save the region.

(Afzal Raza Khan)

U-2: 97

ENAYAT AHMED, "Vegetation of the Himalayas", *The Geographer*, Vol. XXXIII, No. 1, January, 1986, pp. 1-14. 1 Table.

Forests cover the whole of the Pir Panjal Range, Gilgit and Chilas areas of Indus Valley in Kashmir. Most of the Lesser Himalayas and Great Himalayas below the snow-line in Punjab, Himachal Pradesh, Uttar Pradesh, Sikkim, Bhutan and Arunachal Pradesh are covered with forests. Arable land associated with settlements occur in relatively small clearings within the vast expanse of forests. Vast areas in Kashmir, North of the Vale of Kashmir and Punjab Himalayas are Alpine wastes. These are mostly snow covered areas. In Kashmir this Alpine waste is surrounded in

the South and East and, in Punjab Himalayas on the Southeast by pastures which also cover northern Sikkim, most of Bhutan and, the higher portion of Arunachal Pradesh. Jammu and Kashmir has rich forest resources. In Ladakh province the forest area is negligible (5 sq. kms.). 58 per cent of the surface area in Kashmir province and 46 per cent of the area in Jammu Province is under forests.

The write-up throws light also upon the jhuming or shifting cultivation which is still a dominant feature of non-reserved Anchal forests.

There is a general difference between the vegetation types of the Eastern and Western Himalayas. The cooler and more arid Western Himalayas have numbered species in contrast to the Eastern Himalayas which is characterised by heavier precipitation and humidity.

The last section discusses the resources and potential of the vast Himalayas form not only the Sylvan grandeur of the highest mountain of the world with the longest line of snowy peaks above them but have varied environmental, climatic, economic, aesthetic utilities and potentialities because of their botanical range. The altitudinal and latitudinal forest zones in the Himalayas have been presented in tabular form. The most important of the timber species of the Himalayas is the Sal tree, followed by Chir, Deodar, Oak, etc.

(Anjali Gusain)

W. METHODS

W-3: 98

NARVEDESHWAR PRASAD, "Maps: Their Importance and Deceptive Errors" (Hindi), *Bhu-Vigyan*, Vol. I, No. 1, January, 1986, pp. 1-6. 1 Table, 1 Map, 1 Diagram.

Maps are based on map projections and no projection is perfect (correct in all aspects). Information gathered from the maps regarding azimuths, retro-azimuths, distances and shapes and sizes are invariably misleading. This is the key messages of the present paper. For instance, the azimuth of Tokyo from Madras is $N/55^{\circ}52'E$ but the retro-azimuth is $S/82^{\circ}56'W$ and the great circles are distance between the two cities is 6424 km. A comparative study of azimuths and distances of Tokyo from Madras as obtained on 14 selected projections are given in the paper. The azimuthal error varies from -8.69 per cent on polyconic projection to 27.18 per cent on cylindrical Equal Area Projection. The error in distance varies

from -19.15 per cent on Gall's Projection to 57.45 per cent on oblique Gnomonic Projection. The paper also refers that even a photograph of the earth taken from a spaceship or satellite is not free from errors. It witnesses a reduction in area, the amount of reduction increasing away from the centre towards the periphery.

Inspired by the Mecca-Retro-Azimuthal Projection, the author prepared two graticules, one on Kashi-Retro-Azimuthal Projection and the other on Calcutta-Retro-Azimuthal Projection. The latter is also illustrated in the paper. Sometimes scale of a map also creates problem. On a small scale map, even then lines drawn to represent shore-lines, inter-national boundaries, rail routes, roads etc. occupy such space on the map which, according to scale, may represent several km. thick bands. The author maintains that a map must be used judiciously. The use must be fully aware of the limitations of the map with respect to its scale and the merits and demerits of the projection on which it is drawn.

(R.B. Singh)

W-4: 99

SATYA PRAKASH AND S.K. JHA, "Remote Sensing in Delineating of Coastal Geomorphology and Bathymetric Charting: Some Case Studies", *Annals of the National Association of Geographers, India*, Vol. VI, No. 1, 1986, pp. 1-8. 3 Diagrams, 4 Photographs.

The paper introduces the newly developed techniques of "Image Bathymetry" i.e., delineation of coastal features and depths-coastline, low water line reefs, islands, shoal features etc. with the help of observed spectral reflectance by the sensors as recorded in Landsat imagery specially in bands 4 and 5. It outlines the need, scope and application of methodology of obtaining the details from the Landsat imagery, particularly in those areas where no recent hydrographic surveys are available.

The technique of Image Bathymetry is highly useful in areas of mobile sea bed and in the studies of coastal erosion.

The paper outlines the theory of Image formation by remote sensing (Landsat imagery) as to how the satellite imagery are formed when the electromagnetic waves emitted by a source strike the ocean surface ocean bottom, reflected and received by sensors and stores in the Computer Compatible Tapes (CCTS).

The authors have postulated as to how the difference in spectral reflectance of the reflected Electromagnetic waves are stored and measured by Computers and the density slicing (histograms) help in determining the position and extent of various coastal bathymetric features.

The paper also points out the limitation of the above method, imposed by cloudy atmosphere, suspended sediments in the sea water and differences of Refractive Indexes of the different sea waters.

The coastal margins of India offer interesting fields of research for study of development of sand spits, islands, banks, reefs, tidal flats at mouths of rivers on East Coast, Gulf of Machchh and Khambhat. As a sample study on Image Bathymetry and coastal geomorphology, authors have studied Computer Compatible Tapes of approaches to off Bombay, Tuticorin and Kachchh areas, Coral reefs surrounding Suheri Par Island in Lakshdweep and observed the difference in the density pattern of the histograms formed by the Landsat and have deduced the results by comparing these with the existing surveys/charts.

(P. Raju)

W-4: 100

RAM SINGH, "Forest Cover Monitoring Using Satellite Imagery", *Geographical Review of India*, Vol. XLVIII, No. 4, December, 1986, pp. 69-74.

India's forests have been continuously declining in recent years due to a variety of reasons. Currently, the forests occupy an area of, approximately, 75 million hectares. It simply means that this vast area is under the control of forest departments. There is no guarantee that it has a continuous forest cover. Between 1947 and 1967 about 4.15 mill. hectares of forest area have been cleared for the extension of agriculture, for setting up industries and for other developmental projects. This represents an average annual areal loss of roughly 150,000 hec. However, these figures relate only to the planned and authorised encroachment of forest lands. A large portion of forest area is rapidly being denuded due to excessive use with consequent loss of productivity. Further, about 5.14 million hectares of the forest area is under shifting cultivation.

The absence of virtually any reliable data base on the extent and rate of deforestation taking place in the country makes the establishment of a system of continuous operational monitoring of forest cover a necessity. The satellite technology has the potential to

form a basis for such a monitoring system at the national level. Hence, a remote sensing system to monitor deforestation at the national level should be adopted. A system of sampling should be developed. Any sampling programme should include stratification to assure that the density of samples is higher in forested areas subject to greater change. The selected sampling points should be marked on topographical sheets and then carefully transferred on satellite imagery. Ground data in an appropriate format should be collected for all sample sites and centralized 'data bank' need to be created. A set of randomly selected sample set can be used in subsequent monitoring programme using remotely sensed data. The author is of the view that a cost-effective approach to design a continuous forest inventory system can thus be adopted.

(Anjali Gusain)

X. BEHAVIOURAL GEOGRAPHY

X: 101

MUMTAZ KHAN, "The Image of Rajasthan", *Philippine Geographical Journal*, Vol. XXX, Nos. 1-2, 1986, pp. 51-61. 2 Tables, 2 Maps.

In this paper an attempt has been made to test Gould's model of mental maps and to frame and test a number of hypotheses explaining the phenomenon of human perception of space. Quoting from the writing of Cox, Gould and Downs extensively the author seems to be completely falling in line with the view that the knowledge of man about the outer world is not only limited and inaccurate but also attached with value judgements and that it is actually this "subjective", and perceived (and admittedly false) image and not the environment as it exists in terms of "objective" facts which is meaningful and operational.

The author collected information about the images of Rajasthan through a questionnaire convassed among prospective service seekers and postgraduate students studying at the different college and university centres of the state. In constructing the image the author followed the basic logic and procedure of the model of Gould and White. However, the computer based factor analysis was substituted by simple ranking method. The rank of preference for a distinct were added and divided by the number of respondents. The scores were then converted into zero to hundred scale by a technique. The scores were plotted and isopercepts were drawn to depict the image of Rajasthan from a perception centre.

After testing a number of hypotheses the author came to the conclusion that the students images of Rajasthan conformed to the distance decay function. It has been confirmed that the perception centres have got the highest preference scores, the areas of high desirability are nearer to the perception centres, students have discriminated between the adjacent and the distant districts and that district having large cities have been preferred by the service seekers.

(Nasim Aijaz)

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B. POLITICAL GEOGRAPHY

B-6 : 1

STUART CORBRIDGE, Perversity and Ethno-regionalism in Tribal India : The Politics of the Jharkhand, *Political Geography Quarterly*, Vol. VI, No. 3, 1987, pp. 225-240, 4 Tables, 2 Maps, 1 Diagram.

Since independence, the politics of Chhotanagpur and Santhal parganas in eastern India has been much influenced by the Jharkhand Party and by other organisations committed to the formation of a tribal Jharkhand state in south Bihar. Several theories have been advanced to account for the rise and fall of Jharkhandi ethno-regionalism. This article examines an official or perverse account of Jharkhand politics. The perversity model makes three main claims : (1) that British tribal politics were informed by a philosophy of tardy isolationism; (2) that since independence this philosophy has been supplanted by a spirit of integrationism based upon positive discrimination for tribal development ; and (3) that the rise of Jharkhandi ethno-regionalism since 1950 represents a perverse response to the enlightened tribal policies of the post-colonial state. These claims are examined in turn. The paper rejects the isolationist/ integrationist dichotomy. It suggests that the rise of Jharkhandi ethno-regionalism represents a rational response to the opportunities and constraints that post-independence administrations have opened upto, and imposed upon, the tribal communities of eastern India. The opportunities arise from the government's positive discrimination legislation and from its willingness to recognise the scheduled tribes as distinctive political community. The constraints derive from the state's failure to meet the aspirations of this new political community. For the tribal communities of eastern India the state is both a resource and a legitimate target of attack.

(R. K. Mandal)

C- SOCIAL AND CULTURAL GEOGRAPHY

C-3 : 2

S. P. PANT AND A. S. BAGHEL, Sociological Constraints and Attitudes to Development of Tribal Farmers in the Tribal Areas of Madhya Pradesh, *Journal of Rural Development*, Vol. VI, No. 2, March, 1987, pp. 197-210.

The paper presents a record of the existing state of the tribals with respect to a key technological opportunities, the gaps therein and evaluates their attitudes towards development programmes.

It confirms the view that majority of the tribal farmers are optimistic about increasing the output from their existing holdings. Although they are aware of the means of increasing productivity, the use of HYV seeds and fertilisers have not caught their imagination. In fact, no farmer in the sample had ever used to HYV seeds and a very negligible number had used chemical fertilisers.

The tribal farmers were interested in adopting supplementary enterprises for which the traditional know-how existed. Small farmers exhibited greater interest in these ventures. However, capital and supply channels for raw materials and sale of finished products were the major constraint. They were willing to undergo training in crafts to improve their skill and produce marketable products.

There is an urgent need for undertaking public works in these area to provide employment opportunities during the slack season.

It may be inferred from this study that absence of development does not signify that it is not desired. It indicates that constraints to the development are beyond the means and knowledge of the population. Very little has been done in the tribal areas to remove these constraints.

(R. K. Mandal)

C-6 : 3

RANA P. B. SINGH, Toward Myth, Cosmos, Space and Mandala in India : A Search in the Geography of Belief Systems, *The National Geographical Journal of India*, Vol. XXXIII, No. 3, Sept. 1987, pp. 305-326, 3 Tables, 7 Diagrams, 1 Photograph.

An attempt has been made in this paper to study the Geography of belief systems in the framework of myth, cosmos, space mandala in India. The realization of human beings as the supreme species has been understood by the great thinkers of ancient India in their thought processes where superconsciousness and rediscovery of ultimate reality were given prominent place. With spiritual-experimental feelings it has already been exposed that the creation started firstly with the emergence of space and time. This theological frame helped to develop corroboration between 'body'

and 'cosmos', further examined in varieties of mythologies, spatial structure, symbology and even rituals. Since the geography of religion is the study of the part played by the religious motive in man's transformation of the landscape, the study of myth, cosmos, space and mandala becomes a focal theme, especially where age-old traditions are still existing, and are maintained in different forms. India provides one of the best laboratories on this earth.

The analogy of human body as representative of the Universe has been a recurring idea in the ancient thought of India. It has been supposed that the body contains all the elements of Universe in its physical extents and divisions, and also all the gods within itself.

Even folk rituals provide distinct examples of spacing time and timing space. The main finding of the case study has been cited by the author as an example. The cultural-ecological purview has been given prominence in selecting site, and also the mode of the rituals performed, as the puja site lies along the left bank of the Ganga.

(R. K. Mandal)

C-8 : 4

AIJAZUDDIN AHMAD AND S. C. NUNA, Tribal Education : Shadows of an Uncertain Future, *Journal of Educational Planning and Administration*, Vol. I, No. 2, 1987, pp. 90-107.

This paper makes an attempt to evaluate the process of change in educational development among the tribal population of India.

The authors have observed that the tribal population is not able to cope up with the rate of change in other communities not even with the scheduled castes due to physical and social isolation. They are also of the view that the process of economic development and the pattern of interaction with the non-tribal groups in the neighbouring areas of tribal concentration lead to the socio-cultural transformation of the tribes.

The paper examines the problems of spread of literacy rate among the tribal communities and traces the change in literacy rate during 1971-81. Further, an attempt has been made to correlate the decennial change in literacy with a number of variables, such as change in their (i) rate of urbanization during the decades; (ii) worker rate; (iii) proportion of agricultural labourers; and (iv) the concentration index of tribes. The authors have noted that the

change is high in areas where the base is weak. In general, the tribes continue to be tradition-bound and the impact of change is negligible.

In order to understand the process of change in literacy, literacy rates of tribal population of Madhya Pradesh have been analysed at the tehsil level. With an overall tribal literacy rate of 10.68 per cent the state holds a low rank. There are only two states - Rajasthan and Andhra Pradesh which lie below it. The change in literacy rate during 1971-81 has been generally unimpressive. In fact, the change was negative in as many as 37 tehsils.

There is a negative but significant correlation between literacy rate at 1971 census and the decennial change during 1971-81. It indicates that those who were educated migrated out in search of job opportunities.

(Nasim Aijaz)

C-9 : 5

J. P. SINGH, Educational Differentials in Cityward Migration in India, *Man in India*, Vol. LXVII, No. 1, March, 1987, pp. 23-35, 4 Tables, 2 Diagrams.

An attempt has been made in this paper to examine two propositions with regard to the educational characteristics of migrants to cities. Firstly, migration to urban areas is highly selective. Secondly, most educated female migrants are more likely to be dependents of male migrants than workers at the place of destination. It is suggested that these two propositions hold differently in different regions of India.

For the purpose of this paper the author has concentrated on migrant population to urban agglomerations or cities in three Indian provinces : Bihar, West Bengal and Kerala. These states were purposely selected to represent three types of socio-cultural and demographic situations. Here, an effort has been made by the author to establish as to how far these variations account for differences or similarities in selectivity of migration.

It appears that education is positively associated with migration. unexpectedly, Bihar, unlike West Bengal and Kerala, has shown a slightly lower level of literacy for migrants than non-migrants. Two main factors accounting for the lower level of literacy of migrants in Bihar are greater unemployment among educated migrants and higher absorption of illiterate and semi-literate migrants in the urban workforce.

Conversely, the education and work status of female migrants indicate that the level of literacy of non-working migrants is higher than that of the working female population in Bihar and West Bengal. In Kerala, the pattern is the same for both male and female migrants, i.e., the level of literacy working migrants is higher than that of non-working migrants. It seems that education does not prepare women for work in Bihar and West Bengal, while in Kerala education is associated with employment for men and women alike.

(R. K. Mandal)

C-10 : 6

JAIPAL SINGH AND MUMTAZ KHAN, A Model of Marital Linkages for North Indian Villages, *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 45-56.

The paper highlights the network of marital linkages to understand and analyse the complex social organisation of Indian society as well as to understand the spatial behaviour of people as expressed in space.

The paper notes that in India, marital linkages are dependent upon social factors. The social organisation in North India is based on patriarchal system and families are thus patrilineal and patrilocal. This leads to the movements of women only after the marriage.

The marriage rules in North India are rather rigid and do not allow the operation of Ravenstein's law of distance decay. The village exogamy and the taboos on marital links in immediate neighbouring villages will keep an 'eye' of no marital links in the centre of marriage field. The folk wisdom of marrying their daughters to relatively far-off villages produces a belt of relatively less villages, immediately surrounding the central village, in which relatively low marital linkages take place. The ideal distance, for marital links to be established, used to be the one, which a bullock cart could conveniently cover in a day, in some popular village of this belt, these may be clustering of marital links. Beyond this belt the friction of distance will have its effect and marital ties would decrease in frequency as the distance increases. The model, however, is distorted with castes having sparse population in the marital migration field or for brides or grooms rich families or with higher educational status. The model of marital linkages developed

here has been empirically tested in some of the villages of North-eastern Rajasthan.

(M. Ishtiaq)

C-10 : 7

NITA KUMAR, The Mazars of Banaras : A New Perspective on the City's Sacred Geography, *The National Geographical Journal of India*, Vol. XXXIII, No. 3, Sept., 1987, pp. 263-76, 1 Map, 1 Diagram, 5 Photographs.

In this paper an attempt has been made to explore the rich and complex culture of Banaras. It also examines the contribution of Muslim architecture of the city. The Muslim architectural design which is quite distinct from the familiar, much examined, and presumably universal one of Hinduism, has yet very significant parallelisms with the Hindu architectural designs.

The foundation of Islam in Banaras was laid down by many of followers of Ghazi Mian (nephew of Muhmud Ghaznavi). The city is rich with graves and mausoleums built to the Shahids (martyrs) who sacrificed their lives in the cause of Islam. This history is kept alive by the physical presence of the mazars, some abandoned or forgotten, but most of which are active centres of popular worship and entertainment, and by the fact that many localities and mohallas of Banaras are named after these mazars.

Alawi, Masud, Shahid, Banarasi, Masoud Ghazi are some of the ancient mazars of Banaras. At the same time was built the mosque Ganj-e-Shahida, Masoud Qalboni, Ziauddin Ahmad, Jamadi-ul-awwal etc. The mazar and the spot known as Chandan Shahid, located near Basant college and Malaviya Bridge, is the scene of a popular mela held every Thursday in the month chait. Maulvi-Ji-Ka-Bara and all the other favourite mazars of Banaras are the scenes of elaborate decoration and night-long mela on the occasion of shobevat at is organised. Both men and women visit mazar for blessing and good advice.

Mazars present a graphical account of historical cultural heritage of the people and help us understand the historical, cultural and social moorings in the personality of an area.

(R. K. Mandal)

C-10 : 8

RANA P. B. SINGH, S.B. SINGH and A. K. SINGH, Religious Fair, Spatial Affinity and Economics in India: Case of Dadri Mela (Ballia District), *The National Geographical Journal of India*, Vol. XXXIII, No. 3, September, 1987, pp. 277-304, 17 Tables, 6 Diagrams, 3 Photographs.

With an aim to highlight the total perspective of the Dadri mela, in this paper emphasis has been laid on the historical background, sacred time, visitor's perception, spatial structure-plan, shops, management, and problems and prospects.

In 1984 the Dadri fair came into limelight when the founder of modern Hindi, Harishchandra from Banaras visited the fair and performed his three days and gave historical lectures against the British rule. The Dadri fair has two parts - the ceremonial (shops, exhibitions, circus, etc.) and the cattle fair (especially for oxen, cows, buffaloes horses etc.). In fact Dadri fair is responsible for the growth of Ballia town and shaping the culture of this historical town.

A comparison of the statistics clearly reveals the importance of religious perception associated with the fair. With the impact of marketing, geographical situation, and agricultural activities the attitudes towards sale/purchase of cattle are increasing. The motives of recreation among the visitors have been also increasing.

The area of Dadri mela includes circus, theatre, tent shops, main shopping complex, sweet shops and area occupied by administrative, cultural, health and management institutions. Moreover, political parties also arrange their camps. The main functional area develops in an oblong shape, and the street-crossing is the most attractive site. Among the shops - betel shops, cattle neckless, vegetables, general stores, tea-chat, hosiery, cloth, domestic blanket, cosmetics, sweets, hotelling, shoe shops, Gandhi Ashram and recreation shops are important.

(R. K. Mandal)

C-11 : 9

K. M. KULKARNI, Patterns of Social Well-Being in Micro-Regions of Gujarat : A Regional Analysis, *The Indian Journal of Social Work*, Vol. XLVII, No. 4, January, 1987, pp. 389-98, 2 Tables, 2 Maps.

In this paper an attempt has been made to measure the differences in the levels of social well-being in the tehsils of Gujarat. The levels of social well-being have been measured by selecting 36 territorially expressed indicators. These indicators are based on secondary sources of data published in the census reports and the district statistical abstracts. Weightages have been assigned to each of these variables for a tehsil using the functional concentration index, keeping in mind the relationship with micro-regional standards rather than the state averages. This method enables ones to detect the intre-regional micro differences in the levels of social well-being in an effective manner. On the basis of a composite social well-being index the tehsils have been assigned four levels - very high, high moderate and low.

It has been concluded that the tehsils in the Gujarat plain are characterised by a high level of social well-being as compared to the Kathiawar peninsula and the hilly region. The level of social well-being decreases in the following order :Kathiawar core, Kathiawar north and Kachch, Kathiawar coastal, North Gujarat and the Eastern hilly region. The author is of the view that such a study may be helpful in evolving guidelines for minimising territorial disparities in the levels of social well-being.

(Nasim Aijaz)

C-12 : 10

D. N. SINGH AND S. C. RAI, Spatial Organization of Socio-Economic Facilities in Kopaganj Block (Azamgarh District U. P.) An Appraisal of Existing Structure, *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 68-79, 6 Tables, 1 Map, 2 Diagrams.

The objective of the present paper is to focus attention on spatio-functional gaps in the existing structure of the socio-economic facilities so as to provide for some viable suggestions for their proper organisation in space.

Eight attributes, such as administrative, educational, medical, veterinary, transportation, communication, agricultrual, commercial and marketing have been selected by the authors for this study. Each of these have been obtained by grouping a number of variables associated with them. Finally they have been categorised into two major groups - (a) economci facilities, and (b) social facilities.

The authors have used correlation analysis in order to observe the relationship between the indicators of socio-economic infrastructure and settlements. The results show that they were generally negatively correlated, except in the case of primary Schools. The accessibility in terms of transportation facilities emerges as an outstanding factor influencing the degree of socio-economic infrasturcture in an area.

It has been noted that the desired spatial planning can be achieved only through provision of balanced socio-economic and spatial organization of such facilities. An appraisal of the distributional pattern and magnitude of provision of the socio-economic facilities have been attempted by the authors by applying the nearest neighbour and principal component analysis. They reveal that facilities are in general few and far between. Some facilities like primary schools are availbale in considerable number, while others like fertilizer distribution centres, veterinaly hospital/dispensary banking , etc. are far short of the minimum requirement.

(R. K. Mandal)

D-ECONOMIC GEOGRAPHY

D-6 : 11

MINATI SINGH AND S. N. SINGH, Transport System, A Key Strategy for Tourism Development : A Case Study of Varanasi City, *The Geographer*, Vo' XXXIV, No. 2, July, 1987, pp. 46-58, 2 Maps.

The paper highlights the problems relating to planning of a better transport system with a view to promote tourism in Varanasi city. Situated on the bank of the river Ganga, Varanasi owes its early morphological development to easy and cheap transport provided by the river Ganga. The location of the famous Vishwanath temple on the river bank further increased its importance and the place later developed as a religious and cultural metropolis attracting toursits from all over the country and from abroad. Transport has thus emerged as a key factor in the development of the city and in the growth of toursim.

It has been observed that even in the presence of better frequency and intensity, and, varied means of transport and their large network, the system does not work properly due to the lack of proper management and control.

Considering the intensity of the foreign tourist flow and increasing need of trade promotion, it is suggested that Varanasi airport be converted into an international airport. It has also been suggested that Nagpur be directly linked with Varanasi so that other parts of India may be interconnected at shorter distances. The problem of congestion in the city can be solved by looking into the causes of bottlenecks and by observing strict traffic rules. Such improvements in transport system shall be helpful in the promotion of tourism in the region.

(M. Farooq Siddiqi)

E- AGRICULTURAL GEOGRAPHY

E-1 :12

M. SHAFI, "Water Management and Crop Production in India", *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 1-4.

The present paper takes note of the fact that coverage of network in India during the last 30 years has increased from 22 million hectares (1951) to 56 million hectares (1980). However, in spite of the large investment and phenomenal growth of irrigation, the return from the involvement both in terms of yield and finance are not satisfactory. Therefore, this calls for better water management and cultural practices.

The author has also pointed out that wells and canals are the most important sources of irrigation in India which constituted more than 80 per cent of total irrigated area of the country during 1977-78. In order to achieve and ensure a high level of crop productivity, a proper water management and economy water-use is urgently needed. While planning the irrigation schemes, the most important consideration should be the cropping pattern. There is a close relationship between the cropping pattern, intensity of irrigation and the tax on water. Restriction on the use of irrigation water is necessary where water-logging and salinity are apprehended. In the case of intensive crop like rice, with the same quantity of water, a much larger area can be brought under other foodgrains and that would benefit large number of cultivators.

The paper also emphasises that in India the extension of irrigation and advent of high yielding varieties have brought about a considerable change in the cropping pattern. The demand for water has become more exacting and the need for efficient management of land and water is therefore most imperative.

(M. Ishtiaq)

E-2 : 13

S. NAJMUL ISLAM HASHMI, "Spatio-temporal Growth in Area and Production of Bajra and Wheat in the Arid Lands of Western Rajasthan", *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 88-98, 3 Tables, 4 Maps.

In the present paper an attempt has been made to study and analyse the spatio-temporal growth in area, productivity and production of bajra and wheat crops during mid-fifties to mid-sixties, and upto early-eighties in the arid lands of western Rajasthan.

The study notes that bajra is loosing grounds both in area and production in most of the districts, while wheat is gaining in area and production during the period 1965-66 to 1980-81. The decrease in area under bajra is not much but its yield in some districts is decreasing at an alarming rate. It is found that bajra occupies about 84 per cent of the total area under cereals but contributes only 37 per cent to the total production of cereals. On the other hand wheat occupies only about 10 per cent of the total area but shares 54 per cent of the total production of cereals. Districtwise area and production of cereals reveals that all districts have most of their area under bajra except for Ganaganagar and Pali. Irrigation may improve the yield of bajra but limited water resource and wheat being more resistant to serious pests and diseases and giving higher yields are the main constraints for bajra cultivation.

(M. Ishtiaq)

E-3 : 14

K. S. BHASKAR, SOHAN LAL, O. CHALLA and S. H. MADAVI, Agricultural Efficiency of Vidarbha Region (Maharashtra), *The National Geographical Journal of India*, Vol. XXXIII, No. 2, June, 1987, pp. 154-59, 1 Table, 1 Map, 3 Diagrams.

In this paper an attempt has been made to show the effect of soil on agricultural efficiency of the Vidarbha region comprising Buldhana, Akola, Amravati, Yeotmal, Wardha, Nagpur, Bhandara and Chandrapur districts.

Agricultural efficiency of Vidarbha region shows a great variation with a range of 18.26 in Chandrapur to 8.47 in Bhandara district depending upon soil characteristics and climatic variations in the region. Based on the range of data, the area has been grouped into four regions : (a) High efficiency areas, comprising the districts of Yeotmal and Chandrapur districts. Majority of the area has very gently sloping piedmont plain and flood plain which predominantly consists of deep to very deep brown to grayish-brown clay. Hill terrain occupies small area and usually covered with shallow to moderately deep Entisols underlain by rocky substrata. (b) Medium Efficiency area covering Amravati district only. The district has very deep soils, hills with shallow to moderately deep soil cover and few patches of alluvial soil near the streams. The shallow soils are cultivated in patches for millets. (c) Low efficiency area comprises the districts of Akola, Wardha and Nagpur have gently to moderately sloping plateau, piedmont and hills consisting of clay loam to gravelly clay loam, shallow to moderately deep Inceptisols and Entisols with shallow rooting depth, underlain by rocky substrata. These soils are mainly under rainfed agriculture and few patches are irrigated and their potentialities are exploited under intensive agriculture. (d) very low efficiency area consisting of Buldhana and Bhandara districts. In these districts gently sloping rolling lands with uneven rooting depth, gently sloping piedmont, upper and lower plateau with Entisols of shallow to moderate rooting depth occupy major area followed by very gently sloping piedmont and flood plain with deep to very deep Inceptisols and Vertisols that occupy minor extent.

However, there is a good scope to maximise the crop production by creating irrigation facilities and adopting good management practices for crop production.

(R. K. Mandal)

E-3 : 15

J. K. SHARMA, "Agricultural Land Utilization, Planning and Development of Dharwad Taluk (Karnataka)", *The National Geographical Journal of India*, Vol. XXXIII, No. 2, June, 1987, pp. 143-53, 6 Tables, 5 Maps.

This paper examines the impact of physical factors such as soil, landscape and climate on the land-use systems of Dharwad. Due to variation in climate, physiography, soils and rainfall a variety of crops are grown i.e. wheat, jowar, paddy, groundnut, cotton, sugarcane, millets, tur, onion, etc.

The village-wise variation in the degree of concentration of the cultivated land shows that out of 110 villages in the taluk 53 villages have high concentration of agriculture. Almost all of these villages are located in the eastern half of the taluk in the black soil area. Except two villages - Vanahali and Hangarki - no village of high degree of agriculture has forests.

Since 1977-78, the percentage of land under non-agricultural uses has increased from 1.96 to 3.84 per cent in 1981. The non-agricultural use of land mostly includes the land under settlements, roads, and railways.

In general, the hilly western portion of the taluk can be put under vegetation with moist deciduous or semi-deciduous forests. Economically, it may yield more benefit to the farmers if this western section of the taluk is put to plantation of variety of trees. The timber is in great demand and due to the proximity of the urban areas it will fetch more money to the farmers in the present conditions as well as in future due to increasing demand for wood with growing population pressure.

(R. K. Mandal)

E-3 : 16

VARSHA VAID AND V. S. DATYE, Influence of Some Selected Variables on Agricultural Productivity of Maharashtra, *The National Geographical Journal of India*, Vol. XXXIII, No. 2, June, 1987, pp. 175-83, 8 Tables.

In this paper an attempt has been made to trace some of the significant variables influencing agricultural productivity in temporal context taking Maharashtra as a sample. This helps to focus attention on the areas of low productivity which can help in better planning and management in agriculture. The author starts with the initial hypothesis that the productivity is related to some socio-economic variables. This hypothesis is tested by applying correlation and multiple regression techniques taking into consideration six dependent variables and 18 independent variables. Thus, with the help of these quantitative techniques the understanding of the pattern of spatial variations in agricultural productivity, derived with the help of six different indices become very clear. The application of simple correlation and multiple regression help in indentifying the important variables which influence the productivity. Therefore, it can be said that very high

and high productivity regions have a correlation with higher agricultural inputs such as high yielding varieties of seeds, fertilizers, irrigation facilities, size of land-holding, percentage of non-agricultural population and the amount of rainfall.

(R. K. Mandal)

E-4 : 17

J. C. KUNIYAL, Crop Concentration and Diversification in Naini Tal, District, U.P. Himalaya, *The National Geographical Journal of India*, Vol. XXXIII, No. 2, June, 1987, pp. 160-67, 3 Tables, 2 Maps.

An attempt has been made in this paper to study the concentration and diversification of crops and underlying motives of the farmers in the region. The crop concentration and diversification in the region shows that where the magnitude of crop concentration is high, the degree of crop diversification is low. There appears a negative correlation between crop concentration and diversification. The coarse crops such as maize, barley and potato depict high magnitude of concentration, while the chief food and cash crops (i.e. rice, wheat and sugarcane) show almost very low degree of concentration with a higher level of diversification in the hilly tracks.

Cropping system in the region is primarily dependent upon physical factors and secondly upon the socio-economic conditions. Multiplication of crops cannot provide satisfactory returns from the land and consequently it has reduced the value of land productivity. The smaller output in the hilly areas is due to either physical constraints or techno-organisational factors, at the same time the prevailing socio-economic conditions have forced the farmers to cultivate more than one crop in a season and various crops in a year. High magnitude of crop specialization is showing some ill-effects on soil productivity, techno-organisational, and socio-economic environs. Though the existing fertile land, plenty of irrigation facilities and mechanical farming may certainly have encouraged the growth of multiplication of crops but the specialization here has largely been a product of the high degree of motivation.

(R. K. Mandal)

E-7 : 18

S.L. KAYASTHA AND ALOK K. SINGH, An Ecological Agro-economic Regionalization of Mirzapur District, *The Geographer*, Vol XXXIV, No. 1, January, 1987, pp. 69-77, 1 Table, 1 Map.

The present study is an attempt to highlight and assess the level of agricultural development in Mirzapur district of U.P., considering the community development block as the basic regional unit for the purpose.

The paper notes that the area under study has arrived at a period of transition of technological change. The HYV programme tends to accelerate the process of agricultural transformation to an advanced stage. The following regions have been recognised based on the agricultural development. High or prospective agricultural regions, medium or transitional agricultural regions, low or depressed agricultural regions, very low or depressed agricultural regions.

It is also noted that the district is still not well developed agriculturally despite the fact that it has a favourable location. Barring environmental problems to some extent, the bottlenecks of technological and institutional constraints have retarded the growth of agricultural development in Mirzapur. A proper attention should be diverted to the ecological balance the question.

(M. Ishtiaq)

E-7 : 19

S. K. GUPTA, Canal Irrigation Induced Ground Water-table Rise and Its Amelioration, *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 34-44, 3 Tables, 1 Diagram.

The present paper highlights the problem of rising water-table and its effects in some irrigation command areas and suggest preventive and curative measures necessary to overcome the problem in old and new command areas in India.

With the introduction of irrigation, natural balance of the ground-water aquifer is greatly altered. In Haryana where partial or complete lining has been carried out, rise of water-table has

been experienced. More than 12 m. ha. of land is estimated to be affected either by water-logging, soil salinity or both. It is ironical that the areas under water-logging and salinity in these projects are increasing annually and there has not been any attempt to check this as yet. These problems can be solved through various measures such as lining of water distribution system, on-farm water management, conjunctive use of surface and ground-water, improving surface drainage systems, crop selection, planting trees in critical areas, etc.

One of the most important curative measures is to improve drainage through artificial means. This can be achieved either through installation of tubewells or the conventional horizontal tile drainage.

The experience in the irrigation projects in India clearly points out that water-logging appears first at the upper-ends and proceeds towards the tail-end. Thus the problem may be severe at some places compared to the one being monitored.

In the opinion of the author, drainage in its broader sense is a much wider term and should include conjunctive use of ground-water and surface drainage. Probably, if it is agreed upon and in practice it should be, there appears to be no controversy. These steps along with other suitable preventive measures should be adopted simultaneously with irrigation. What can probably be accomplished at later stages is the horizontal tile drainage only in areas where these practices have not been able to stop the occurrence of water-logging.

(M. Ishtiaq)

E-8 : 20

MOHAMMAD ABUZAR, "Agricultural Responses to Population Differentials in the Punjab-Haryana Plain", *The Geographer*, Vol. XXXIV, No. 2, July, 1987, pp. 59-66, 1 Table, 3 Maps.

Agricultural economy encompasses three broad aspects, i.e. input, process and output of which the paper deals with only output as it also reflects the impact of inputs and processes. Population differentials are the constituents of distinct set of inputs and processes which operate as factors and have an impact on agricultural output. Therefore, the author has selected four population differentials and four agricultural responses to support his hypothesis that the variation in agricultural responses are

explained spatially by the population differentials. The paper is based on district level published data for Punjab-Haryana plain.

The author has used three methods, viz., Pearsons product-moment coefficient of correlation, ordinary least-squares bivariate regression, and Court's method of map comparsion under major headings of possible association, yield in response to pupulation and spatial association.

The anlysis reveals that there is a positive correlation, between yield of food crops and population density. One-fourth of variation in the yield of crops has been explained by the variation in population density in the districts of the study region. However, the test based on Court's method distinctly negates the spatial significant correlation mentioned above which is mainly because of the meagre number of observations considered. Nevertheless it suggests that this association might be simply by chance.

(M. Farooq Siddiqi)

E-8 : 21

RAMA PRASAD, Impact of Consolidation on Non-Agricultural Landuse in Chandauli Tahsil, Varanasi District (U. P.), *The National Geographical Journal of India*, Vol. XXXIII, No. 2, June, 1987, pp. 168-74, 2 Tables, 3 Maps.

The present study of Chandauli tahsil aims to analyse the pre (1962-63) and the post-consolidation (1984-85) conditions with a view to evaluating the impact of consolidation on non-agricultural landuse in the tahsil. The non-agricultural landsue has also undergone significant changes under the impact of consolidation. In fact, the area under groves and pastures have increased whereas the area under cultivable waste has decreased over time after the consolidation. Most of the usar and banjar lands have been reclaimed and turned either into agricultural land or put under groves. The decline in the percentage of cultivable waste (usar & Banjar) land after consolidation shows marked spatial variations in the Ganga and the Karmanasa Khadars.

A marked feature of the post-consolidation period is an increase of 10 to 20 per cent in the area under cultivable land in the tahsil, especially in the two towns (Mughalsarai and Chandauli) and the urban centres like Sakaldiha, Chanhaniya, Dhanapur, Kanta and Beburi. However, there has been a decline in some parts, amounting to about 15 per cent of the total uncultivable land, mainly on account of the reclamation of tals for agriculturable land.

In general the area under non-agricultural land that is 13.4 per cent of the total area, as against before consolidation (1962-63), recorded a post-consolidation increase of 8 per cent only. Further, the area under non-cultivable land has increased due to an increase in the area under settlements, transports network, irrigation networks etc.

(R. K. Mandal)

E-11 : 22

M. SHAFI, Government Policy and Food Systems in India, *The Geographer*, Vol. XXXIV, No. 2, July, 1987, pp. 1-4.

The agrarian social structure in India during the colonial period was feudal in character and was so conditioned that the agricultural economy was in a state of stagnation. But after independence a basic change has occurred in the food system of the country owing to a change in the agrarian structure. The production of foodgrains has trebled compared to the 1951 level as a result of adoption of new techniques and hired labour, which in turn are the consequence of government policy on land tenure. The fixation of prices of various foodgrains before the sowing season has provided relative stability and reduction in seasonal fluctuations in the food system of the country. The government policy is also responsible for influencing the type and location of crops. As a result of government ensuring remunerative prices to farmers by way of incentives to produce more and improve productivity. India today has built up a large buffer stock foodgrains.

While ensuring the food security system, the buffer stock has created some problems. The inadequacy of storage facilities leads to loss of grains lying in open. Besides, the poverty of people in general and the lack of purchasing power keeps the poor undernourished even though the foodgrain stocks may be over flowing. The Government of India has therefore formulated new schemes to raise the purchasing power of the rural poor.

It has also been suggested that the National Landuse Policy based on land classification and land capability survey will further help in improving the food production. Simultaneously, the formulation of National Food Security System will be fruitful in eliminating nutritional disorders.

The author strongly feels that the food system of the country is highly influenced by the government policies in all its aspects.

(M. Farooq Siddiqi)

E-11 : 23

V. K. SHRIVASTAVA, Storage of Foodgrains in Eastern Uttar Pradesh : Present Status and Future Planning, *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 78-87, 3 Tables, 2 Maps.

The paper highlights the present status of storage of foodgrains in eastern Uttar Pradesh and putforth some suggestions for its future palnning in view of the increasing foodgrains production.

It is found that the Food Corporation of India (FCI) controlled nearly 45 per cent, the Warehousing Corporation nearly 42 per cent co-operative sector claiming nearly 6 per cent and 4 per cent by State Warehousing Corporation of the total storage capacity. The spatial distribution of storage facilities shows that the Food Corporation of India has established its warehouse in each of the districts of eastern U. P., except Ballia and Gazipur districts.

It is to be noted that the location of warehouses seem to have been influenced by two factors i.e. administrative status of the centre concerned and the means of transportation. But the warehousing facilities are now being established near newly constructed mandi-centres. It means that foodgrains are collected from rural areas and stored mainly at urban centres for reasons of security and accessibility which does not hold good for the redistribution of foodgrains to rural areas due to its rebounding effect on the escalation of price of food grains.

The study also pointed out that the existing foodgrain storage facilities in eastern Uttar Pradesh are generally beyond the reach of the people of this area. Thus, the establishment of storage facilities at small places should be given priority in the planning of foodgrains storage facilities preferably in rural areas which will be beneficial to the rural population of the region.

(M. Ishtiaq)

F- INDUSTRIAL GEOGRAPHY

F-I : 24

NITYANANDA SARKAR AND ROBIN MUKHERJEE, Depen-
dence of the Small Scale Manufacturing Enterprises on

the Organized Sector - Some Evidence, *Arth Vijnana*, Vol. XXIX, No. 3, Sept., 1987, pp. 286-96, 6 Tables.

An attempt has been made in this paper to present some results obtained through a sample survey conducted some of the small-scale enterprises. In the survey the small-scale enterprises were divided into the following four categories : (i) Units working exclusively ancillary to one or more big enterprises, (ii) Units serving exclusively one or more intermediaries, (iii) Units carrying out their activities completely independently i.e. procuring the raw materials and marketing the output independently, and (iv) Units combining two or more of the above as the 'mixed' type.

The main focus has been given on the link between the so called organised sector and the small-scale manufacturing enterprises, which use iron and steel as an input. This was done on the basis of data available from the sample survey conducted in the CMD area. It has been pointed out that there is a considerably large degree of dependence of the small enterprises on the large ones. It has also been suggested that growth of such small enterprises is not critically tied to one single big enterprises. Nevertheless the fact remains that the fortune of the small units is heavily dependent on the big ones.

(R. K. Mandal)

G- GEOGRAPHY OF MARKETING, TRANSPORT AND COMMUNICATIONS

G-2 : 25

R. S. DIXIT, Distribution of Market Centres in a Backward Economy : Hamirpur District, U.P., *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 80-88, 3 Tables, 7 Maps.

The author has made a modest effort to analyse some perspectives on the distribution of market centres of the district of Hamirpur (U.P., India). The distribution pattern of the market centres has been identified with the help of the 'Nearest-Neighbour Analysis' method. Most of the sub-units of the Hamirpur district, are below the mean level, and hence the average of all the parameters point towards a low level of spatial distribution of market centres in the district. It is evident that two sub-units Rath and Panwari have a distributional pattern showing moderate

clustering. There are six market centres in Rath - out of these Rath, Rath Dakhin and Rath Purab are located very close to each other, while the fourth one, Kuasba khera, is also not very far off from the above centres.

The distribution of market in terms of periodicity has been also attempted by the author. It is obvious that weekly marketing activity is a practice in the study area. Out of a total of 78 market centres, as many as 62 are the weekly market centres. Out of the total, 12 market centres are the urban market centres. Among the urban market centres, there exist five daily market centres, four bi-weekly, and three weekly market centres.

(R. K. Mandal)

G-2 : 26

SMITA JOSHI, The Spatial Pattern of Drug-Retailing in Pune, *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 35-48, 4 Tables, 2 Maps, 4 Diagrams.

The present study analyses the spatial pattern of one single function, i.e., drug-retailing, and attempts a cross-sectional exposure of an Indian, second rank metropolitan city as nested within its rural hinterland.

The pattern of distribution of drug-retailing and doctors depicts a strong core-periphery as well as rural urban bias at various spatial scales. Thus, not just inertia but accessibility, volume of aggregate and effective demand and profit-maximization are the main factors affecting the distribution pattern. The retail core of the old Pune city as well as inner peripheral units dominate the urban spatial pattern. Similarly, Pune city as a whole experience high concentration in terms of drug-retailing as against other urban centres in P.U.A. The latter again enjoys a better standing among the rest of the taluks in the Pune district.

This disparity in the distribution indicates that as the level of urbanisation increases drug-retailing tends to be more ubiquitously and becomes a less specialised function, demanding relatively low threshold requirements. While in rural and relatively less developed areas, where needs for drugs is not definitely less, it remains to be a highly specialized function and is less accessible in terms of economic distance.

The author suggests the following measures so as to reduce the existing territorial injustice : (a) while issuing licenses for drug

stores, pattern of distribution of population should be considered and not merely the aspect of effective demand and supply. (b) retailers ready to initiate drug retailing in new, less developed and low profitability areas may be given subsidies, greater trade commission and credit facility with a low rates of interests; (c) establishment of drug stores based on the principle of consumers co-operatives may be promoted; and (d) mobile drug stores along with doctors be introduced.

(R. K. Mandal)

H- POPULATION GEOGRAPHY

H-2 : 27

B. K. ROY, Demographic Transition and Growth of Population in India by A. D. 2001, *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 17-28, 5 Tables, 2 Diagrams.

The present paper deals with the concept of Demographic Transition, system of vital rates and methods of population projection as practiced by the census of India. The issue of population growth is highlighted in the regional frame of India in relation with the potentials of economic development. The population growth in space and time have created tunnels of darkness. The scientific technological means at times come to the rescue but they have been largely insufficient in the face of the overriding population problems which itself has been so diverse. In the light of above, some demographic theories were evolved. Landry propagated three stages in 'demographic transition', viz. primitive intermediate and modern regimes.

According to census statistics, Indian population decadal growth during 1911-81 has been to the tune of 5.75 per cent in 1901-11 to 25 per cent in 1971-81. Taking vital rates of states/Union Territories for the period 1981 and 1983, the author observes that the birth rates and death rates in rural urban areas of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh have been positive against the vital rates at the national level. Besides these states, the trend in the vital rates are astonishingly higher than the national average and those of in Haryana and Gujarat.

It is concomitant to point out that the growth in years to come and by 2001 A. D. is really worrying the planners in the country. Only hope as set in by the family planning programmes to effectively protect 48.8 per cent couples may bring population

around 99.5 million by 2001 A. D. reducing the birth rates to 24.42 according to medium fertility assumptions.

(R. K. Mandal)

H-3 : 28

FARASAT ALI SIDDIQUI, Spatio-temporal Analysis of Population Ageing in Uttar Pradesh, India, *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 57-68, 1 Table, 3 Maps.

Population ageing (PA) is one of the significant aspect of age-structure and has a significant bearing on the national economy. This is the main focus of the paper. The approach of the author in this paper is based on the district level data for three decadal census years 1951, 1961 and 1971. The study aims at the following objectives: firstly, to the identification of elderly and PA regions of Uttar Pradesh, secondly, the direction and magnitude of change in PA since independence; and , finally the degree of relationships between PA and the 23 probable independent variables which has been put to statistical tests.

The study reveals that India and Uttar Pradesh carry a low index of PA which is characterised by a high population of juvenile dependents and low aged population. All the districts of Uttar Pradesh are also characterised by low index of total population ageing (PA). These are, however, found some notable inter-district variations.

The study also shows that about 35 per cent of the districts have a TPA index lower than the state average while high PA is found in rural areas. But in urban areas 43 per cent of the districts fall under the medium category and the range of variations in UPA is significant by wide. The range of variations in the indices of UPA was found to be relatively small and narrow in 1961 as compared to TPA and RPA in the following censuses. In 1951 the district wise distribution of PA was almost similar in TRU areas and 50 per cent of the districts were considered to be under medium category of PA.

The assessment of 23 variable and their relationship with PA leads to the conclusion that the percentage of rural population growth, sex ratio, primary occupation, tertiary occupation, migration rate, workforce, and literacy are the significant variates of TPA. The first four have the positive relationship and the remaining the inverse. The regional variation in RPA is caused directly by percentage of rural population, agricultural density, sex-ratio and migration rate. UPA is influenced by sex ratio and

population density positively and negatively by literacy, agricultural density, work participation, tertiary occupation and male migration.

(M. Ishtiaq)

J- SETTLEMENTS : URBAN

J-2 : 29

A. K. SINGH, Bihar : Urbanization in Perspective, *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 49-67, 7 Tables, 4 Maps, 1 Diagram.

The aim of this paper is to find out the level of urbanization, its spatio-temporal characteristics to see its relationships with the process of development of Bihar. The problem has been approached by taking into consideration the trends in growth of urban centres in their physical, social and cultural expressions.

The author is of the view that there has been a general slackness in the uniform urbanization process throughout the region. The Chotanagpur plateau is more urbanized but it has drawn in urban population from the existing centres while South Bihar Plain is less urban and it is least in the North Bihar Plain. Urban centres have developed in and around the mining and industrial areas. However, after 1951, there has been comparatively a rapid growth of centres in Chotanagpur plateau but most of them especially with mining base have experienced arrest in their rates of growth as mining became increasingly uneconomical and thus few job-opportunities. In these centres, secondary and tertiary activities should be developed along with the provisions of infrastructures, like transport and communication, water supply, educational facilities, credit and banking, marketing, managerial services, health centres, veterinary hospital, and branches of the cooperative consumer stores etc. After the establishment of such centres, additional facilities will consequently develop. Rural industries like sugar mills, cotton processing centres, oil mills, jute mills and a number of rice mills should be established in these areas.

Urbanisation needs to be coordinated not only with increasing employment in non-agricultural sector and redistribution in income levels but also with socio-economic infrastructure to promote dispersal of development patterns. The goal of urban development should be to establish an urban-rural continuum,

replacing the existing urban-rural dichotomy, and an articulated settlement and regional hierarchy systems.

(R. K. Mandal)

J-2 : 30

S. D. MISRA AND S. K. SARASWAT, Mathura City in 2001 A. D., *The Deccan Geographer*, Vol. XXV, No. 1, January-June, 1987, pp. 159-65.

The existing trend of development is mainly concentrated on the existing developed areas and are generally located along the major highways. Besides these, few residential areas have also sprang up here and there and a sizeable development has occurred outside the existing developed area. The paper takes note of the existing land use pattern, trends of future growth, physical constraints, future land requirement under different uses and other criteria like physical and functional inter-relationship etc. for Mathura city keeping 2001 A. D. in mind.

After finding out the area requirement for the additional population and to mitigate the existing shortage, the authors have subdivided the entire urbanisable limit into suitable sectors of zones, each of them having its own character of growth, pattern of land use, topography of land and other economic, social and cultural aspects. It is also to be noted that while proposing the future urban limits vis-a-vis planning zones the consideration for historical growth has also been kept in view.

The proposed urban limit have been divided into four : (i) proposed zone, (ii) existing developed area, (iii) central use zone, and (iv) reserved area for future expansion - after 1996.

(R. K. Mandal)

J-5 : 31

M. SETHI AND S. PANDEY, Urban Land Use Changes : A Case Study of Union Territory of Delhi, *The National Geographical Journal of India*, Vol. XXXIII, No. 1, March, 1987, pp. 29-34, 5 Tables, 1 Map, 3 Diagrams.

In this paper an attempt has been made to analyse the recurrent land use changes in the Union Territory (Delhi) in the light of increasing population, industrial expansion, trade and commerce,

transport, government offices, housing, dairy, nurseries and civic facilities.

The growth of urban population in the Union Territory in the last two decades has been phenomenal. From a mere population of 405,819 in 1901, it has increased to 6.2 million in 1981. A very high annual growth rate of 4 per cent in the period from 1961-71 had been experienced by Delhi.

The landuse changes in case of industrial, residential, trade and commerce, and . transport have been quite significant . In 1970-71, there were only twenty six thousand industries in the territory with an investment of Rs. 190 crores. By 1980-81 the number of industries has spiralled to forty five thousand with an investment of 867 crores. The area covered by industries has increased phenomenally. There exist five National Highways which carry passengers to and fro and cater to the industrial, commercial and social and administrative needs of the city. A mixed landuse pattern has emerged. The airport authority has expanded the international airport providing for new terminals and runways. land under government usage has considerably increased since 1959 when the government was still in its infancy.

To cater to a large population increase over the years, facilities such as medical, educational, water, electricity, sewage etc. have considerably increased. Area under agriculture in the form of nurseries and urban villages stands at 2560 hectares in 1981. Vacant and land under construction is being used by D.D.A.

The paper is thoroughly descriptive and exploratory in nature.

(R. K. Mandal)

J-6 : 32

R. S. TRIPATHI AND J. P. VISWAKARMA, Dynamics of Diversification in Economic Base of Class I Cities (U.P.), *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 19-23, 1 Table.

The paper argues that the cities with large population size are economically less diversified than the smaller ones. The larger cities also show decreasing trends in the process of economic diversification.

The authors have classified the diversification indices into three orders, i.e. low diversified cities, medium diversified cities and high diversified cities. It is noted here that out of 21 cities, 13 were low

diversified and 4 were medium diversified cities in 1971 which remained more or less the same in 1981. The coefficient of correlation between population size and diversification indices of cities was significant at 5% level in 1971 as well as in 1981, thus it may be ascertained that the cities of large population size are economically less diversified.

Significant changes are also noted in economic characters of class I cities of U.P. during the decade. In 1971 Rampur and Farrukhabad were in the category of low economic diversification and in 1981 both the cities fell under the category of high diversification. Bareilly and Moradabad were medium diversified in 1971 and in 1981 they are low diversified. Agra shifted from medium diversification in 1971 to high diversification in 1981. Allahabad, Gorakhpur and Etawah were high diversified in 1971 and in 1981 Allahabad delegated itself to medium diversified and Gorakhpur and Etawah as low diversified.

(M. Ishtiaq)

J-7 : 33

SUMITA SENGUPTA, The Concept of Growth of Suburbs in the Western and Non-Western Countries, *The Deccan Geographer*, Vol. XXV, No. 1, January -June, 1987, pp. 121-25.

This paper analyses the factors and conditions which are responsible for the growth of suburbs in the Western Countries especially in the USA. However, in developing countries such as India the growth has been constrained by several problems.

In Western Countries and in America after the world War II, due to industrialisation the city was expanding at a faster rate and there has been changes in the landuse pattern. The affluent people of the U. S. A. got settled in the suburbs due to congenial environment and the presence of infrastructural facilities. Transport network, and electricity, played a significant role in the growth of suburbs.

In contrast to the U. S. A. and other developed countries, the non-western countries where a majority belonged to the low income groups, distinct landuse pattern developed as a result of their socio-economic characteristics. For people belonging to the low-income groups time and cost on transportation may be saved considerably, when goods and services are available at one place, that is at the city centre. Sellers prefer to have shops at central location so that the total number of buyers may not be divided into

smaller suburban shopping centres. Residents have developed a strong sense of attachment to the ancestral houses and they enjoy social status and social interaction with friends and relatives, because of which they do not like to leave the core city. As a result, commercial activities, light industries etc. are also found together with residential landuse at the city centre.

(R. K. Mandal)

J-8 : 34

V. T. GHARPURE AND C. T. PAWAR, Centrality and Hierarchy of Agro-Service Centres in the Panchaganga Basin (Maharashtra), *The Geographer*, Vol. XXXIV, No. 1, January, 1987, pp. 24-33, 3 Tables, 3 Maps.

The present study deals with the centrality and hierarchy of agro-service centres in the Panchaganga basin where agriculture is a significant sector of economy.

Places having minimum four functions are considered as agro service centre, viz. fertilizers, seeds, banks, hired implements, repairs, extension services, veterinary dispensaries, markets, soil analysis centres, petrol pumps etc.

The composite scores of centrality obtained by Davis' Method clearly indicate that the places having high centrality are located in the central and eastern parts of the Panchaganga basin whereas western and northwestern parts have association of low centrality centres.

Agro-service centres located in urban areas have high centrality, which provide more services to the peasants. On the contrary, the agro-service centres located in rural areas are more in number having low centrality. They provide minimum facilities to the farmers. It is also observed that the economically prosperous areas have more agro-service centres of higher order while economically backward areas have less agro-service centres of low order.

(M. Ishtiaq)

L- REGIONALISATION, REGIONAL DEVELOPMENT PLANNING

L-2 : 35

H. C. LAL DAS, Identification of Backward Regions For Micro level planning : A Study of Block Level Development in Sitamarhi District of Bihar, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 95-101, 2 Tables.

The main objective of the paper is to study the level and magnitude of the backwardness of Sitamarhi district at the block level and to examine the case of decentralisation of planning at district as well as block levels.

In the present study the level of development of backwardness and the composite index of development for each block has been calculated. With the help of the available data on various indicators along with their respective weights assigned to assess the regional or block-wise pattern of the development. The range of composite indices has been found from minimum of 72.79 in Runni Saidpur Block to 146.28 in Majorganj Block. Altogether, nine blocks have been found above the district level, while the rest six blocks have been found below the district level. The level of backwardness of the three North Bihar districts, Muzaffarpur, Sitamarhi and Vaisali and of Bihar as a whole have been presented. The results reveal that on most of the aspects, Sitamarhi district has the last position among the three districts.

There is an urgent need for creating an agency for 'Intensive Integrated Rural Development' that can coordinate the activities of different developmental and financing agencies engaged in uplifting the rural masses. There should be one such agency in each block. It will undertake microlevel planning with the village as the basic unit.

(R. K. Mandal)

L-2 : 36

L. SHRIDHARAN, District Planning A Review, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 65-77.

This paper reviews the district planning efforts in the past starting with the official approach. This is followed by some

assessments from other scholars in this field. The last section deals with suggestions and alternative views.

District planning has been emphasized since the formulation of the Second Five Year Plan. It started with a District Plan which was to include programmes prepared on a territorial basis for villages, group of villages, *talukas*, extension blocks, municipal areas, etc. This also has programmes to be executed within the district. These are derived from departmental plans formulated at the state level. Such plans were formulated to cover a wide variety of things. These include community development, national extension programme, social welfare extension programme, development of cooperatives village panchayats, land reforms, and so on. Stress was also laid on development of agriculture and allied activities, village and small industries, mobilising, small savings, welfare of backward classes, expansion of education, sanitation, malarial control, family planning and so on.

Despite these laudable objectives, district planning simply did not take off the ground under the Second Five Year Plan. As a matter of fact, most of these measures were initiated only in the last decade even in the states advanced in district planning.

The suggestions emphasized the need for strengthening planning at the state level, improving centre-state financial relations, clear division of areas of activities around centre, state and local institutions and autonomy and flexibility for local level bodies. These observations were in the context of positive thinking on district-level planning.

(R. K. Mandal)

L-2 : 37

S. K. MANDAL, People's Involvement In District Planning : Organisation Framework, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 31-34.

The paper seeks to emphasize the importance of micro area studies and peoples involvement in district, level planning in India.

District is considered to be the most viable unit for planning. However, encirclement of a district may not satisfy the geographical and economic criterion for a spatial unit of planning. District provides the inter-industry links between the regions, states and the nation on the one hand and sub-divisions, blocks and villages on the other. District wherein a hierarchy of planning decisions at different areal planning is conceived in a multi-level planning

framework levels is required. These different levels may be entrusted with different planning functions viz., planning implemetation, coordination and review with suitable vertical and horizontal linkages to ensure proper coordination of these functions and the achievement of the overall objective of the acitivity concerned. There may be district-wise segments in each sectoral plan separately in order to ensure the decentralised system of planning. District plans may be prepared by the district planning authority after taking due account of resource endowments, level of development, spill-over commitments, local participation, etc.

District plan is expected to secure greater involvement and participation of people in the process of development. People's participation is essential for the success of every type of planning which may be commensurate with the main philosophy of the decentralised planning in the achievement of the even distribution of benefits of development.

The organisational framework of district planning as existing now in different states is not enough to secure active development of the people. Decision-making has also to be developed to the lower levels in order to bring the problem of local conditions into proper focus in the planning process.

(R. K. Mandal)

L-3 : 38

K. L. NARSIMHA MURTHI AND P. V. SARMA, Central Place Theory in the Indian Context - A Survey, *The Deccan Geographer*, Vol. XXV, No. 1, January-June, 1987, pp. 151-58.

The spatial integration is a necessary condition for achieving functional integration and stimulate growth in a development plan taking into account the resource endowment of the region.

The spatial integration means integration of spatial units with each other and also with the higher level planning for social and economic activities. This helps generate growth and development process within and outside the clusters.

Planning for integrated area development requires (1) Spatial Integration - Integration of spatial units with each other and also with the higher level planning units, (2) Functional integration - identification of service centres and delineation of their service areas which are viable enough to support the minimum essential

services within the reach of the dependent villages and (3) Planning for development - to plan for economic development of the region after identifying the resource potential. Thus the Integrated Area Development seeks to achieve a sort of integration of spatial, functional and development activities.

Keeping in view the present situation this paper studies the resource position and presents an integrated area development plan at the *taluka* level, in this direction for investigating the development process in a deltaic *taluk*.

(R. K. Mandal).

L-4 : 39

A. K. SINGH, Decentralised Planning in U. P. - A Critical Appraisal, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 49-54.

The need of decentralized planning arises not only for considerations of administrative convenience and efficiency given the vast size and diversity of the country.- In fact, decentralised planning must be seen as an instrument for making the planning process more responsive and relevant to the people's nees and problems. This will not only ensure greater social justice but will also help release talent potential of human and material resources. Thus decentralised planning is not only a cost-reducing but also resource augmenting process.

Thus, a genuine programme of decentralised planning with people's participation in a fuller sense would require a radical departure from the existing planning mechanism. In this scheme of things the government supporting and encouraging lower level institutions instead of that of controlling and directing them.

The U. P. experiment reveals the pitfalls and problems of decentralised planning. The political leadership as well as the bureaucratic cadres at the state level while committed to the ideology of decentralised planning are unwilling to go the whole hog and allow greater say to local people in the planning process for fear of loosing their influence and power. Without such a willingness and commitment no programme of decentralised planning and people's participation can hope to succeed.

(R. K. Mandal)

L-4 : 40

B. M. JOSHI AND H.S. VERMA, Decentralised Planning in Uttar Pradesh : An Examination of the Experience of its First Stage, *Indian Journal of Regional Science*, Vol. XIX, No. 1, pp. 1-30, 4 Tables

Decentralised Planning has been treated as an evolutionary process which had some transitional phases. These had to be clearly recognised in any exercise pertaining to its evolution and growth. The working Group on District Planning mentioned three such stages : (a) the phase of initiation; (b) limited decentralisation; and (c) the final stage. The U. P. Scheme introduced in 1982-83 clearly belonged to the 'initiation phase'. It has been in operation for over four years now and it is reasonably long enough period to examine whether the initial stage of the decentralised planning process has had smooth sailing. Whether its operation during this period has strengthened the decentralisation process and whether the necessary steps have been undertaken in order to initiate the next logical stage.

Brahm Dutt Committee emphasized that as a result of decentralisation, imbalances in development levels of districts and areas within the same districts would be steadily removed to the extent possible, and all districts would be given opportunity to attain full development according to their potential, available manpower and other resources. The Committee listed the objectives of the scheme of decentralised planning - "Development with social justice, optimum and best possible utilisation of local physical and human resources for the economic development of the district".

(R. K. Mandal)

L-4 : 41

K. K. MISRA, Service Centre Strategy in the Development Planning of Hamirpur District U. P., *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 87-90.

The purpose of this paper is to project the problems related with the development planning of Hamirpur district and to find out their possible solutions. The study regions has been subdivided into four sub-regions on the basis of physical characteristics into : Hilly upland tract, Gangetic plain tract, river Betwa and Yamuna lowlying tract and Birma and Chandrawal plain tract.

The administrative organisation of the district consists of six tahsils of Hamirpur, Maudaha, Charkhari Mahoba, Rath and

Kulpahar; eleven development blocks and 90 Nyaya panchayats. There are twelve towns and 930 villages in the district. On an average there is an urban centre for every 78 villages. A number of physical economic and socio-cultural restraints interact in inhibiting the process of socio-economic transformation.

A major part of total population i.e. 81.79 per cent depends for its livelihood directly on agriculture. The problems of floods and droughts have yet to be tackled. The cultivators of the remote village communities, being cut off from urban and market centres, do not have adequate choice of selling and buying the essential commodities. The level of urbanisation is as low as 16.61 per cent.

The three major problems identified by the author in the process of development are problems of horizontal linkage, diffusion of innovations and decentralization of economic activities.

(R. K. Mandal)

L-4 : 42

R. V. VERMA, Decentralised Planning for Unified National Development, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 91-94.

It is now accepted that decentralisation in development planning enables a better understanding the needs of the local areas, helps make better decision-making possible, gives people a greater voice in the decision making process, better co-ordination and integration of programmes etc.

The end product of such decentralisation of development planning will be transformation of man. The economic growth with socio-economic equity through equitable allocation of resources and the provision of employment opportunities can go a long way in bringing about balanced and optimal development. The efforts of voluntary organisations and research institutions in realization and of the objectives of district level planning has been dealt with by the author.

(R. K. Mandal)

L-4 : 43

S. B. SINGH AND B. N. SINGH, Planning for Socio-economic Facilities in Ghazipur Tahsil, U. P., *The National Geographical*

Journal of India, Vol. XXXIII, No. 1, March, 1987, pp. 89-96, 4 Tables, 2 Diagrams.

An attempt has been made in this paper to emphasize maximization of the developmental activities in a particular region. This has been attempted on the basis of spatio-functional interaction system, transformation and modification of the socio-economic situations and methodology involving the hierarchy of spatial functions. The tables show that all the administrative functions (Block Head-quarters and police station), post and telegraph offices and banks show highly dispersed distribution. Only two functions i.e. bus stand and dispensary, are randomly distributed. The majority of the functions (9 in number) fall into the category of 'low dispersion', and 4 functions, i.e. primary school, intermediate, sub-post office and primary health centre fall into 'moderately dispersed' category.

It has also been found that most of the higher level functions are located in a few settlements, having favourable location and population size. At times location of a particular facility is highly politically motivated. It was also observed that uncertain and irregular distribution was the main cause of the discrepancy in the functional hierarchy. The lower level of functions are highly positively correlated to such other but general tendency of the lower order functions is that they are poorly correlated with high-order functions. The threshold population criteria and its modified form have been found much suitable in planning for socio-economic facilities in the study area.

(R. K. Mandal)

L-4 : 44

S. C. SHARMA AND M. L. SHARMA, Planning Strategy for Development of Social Facilities - A Case Study of Tahsil Tarabganj, District Gonda (U. P.), *The Deccan Geographer*, Vol. XXV, No. 1, January-June, 1987, pp. 127-38, 3 Tables, 2 Maps.

The main objective of this paper is to 'study the distribution of social amenities like education, health, drinking water and recreation, etc. The authors have attempted to visualize the distribution pattern in the light of : (a) the distance-minimization of social services, (b) the size of population per social facility, (c) adoption of national minimum-needs programme, and , (d) active people's participation.

The study area has only 18.7 per cent literates, which is far below the national average. Most of schools and intermediate colleges are concentrated in the northern part of the tehsil, while the southern part of the region is devoid of these facilities. Keeping this in view, goal-oriented strategy has been put forward. The facility of primary school should be provided in every village by 1995 and girls intermediate college at suburban places.

Distribution of health facilities in rural and urban areas is far from satisfactory. The authors suggest that medical facilities be provided for an area with 5 km. radius.

Looking into the basic need of human beings i.e. water supply and disposal of waste, the authors feel that improvement in the supply of drinking water and disposal of waste be immediately taken up. Lastly emphasis has been laid on the improvement of mass-media which play an important role in educating the rural people in agricultural extension, family planning, health and hygiene programmes etc.

(R. K. Mandal)

L-6 : 45

B. P. MAITHANI, Participatory Planning for Rural Development : Conceptual Framework and Operational Steps, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 55-63.

Participatory planning is a process by which a community undertakes to achieve a given socio-economic goal by conscious diagnosis of the problems and charting out the course of action. It is different from the one that carries development to the people. The starting point in this approach is organising and activating the people with a view to generate development from within as they plan for themselves. Participatory planning, thus, begins with action and not by abstract process of plan-formulation using standard techniques. This implies that analysis of the objective situation should be done not in the offices of the development functionaries but with active participation of the people in their own setting preferably in the panchayats. The role of experts in this should enable the people to take rational and relevant decisions.

Participatory planning can help the experts to discover the usefulness of ideas coming from the people who in turn start accepting the advice of the experts. This can be achieved only when

the planner does not talk from the position of authority but from the vantage point of horizontal dialogue among equals.

One of the prerequisites of an effective participatory planning at the local level is a full and sustained commitment on the part of government. An expression of this commitment could be the recognition and support to community-based institution for this purpose or in the absence of such institutions, formation of locally-based development planning organisations at the village level. To be operational and effective, however, these local planning organisations have to have adequate administrative authority, financial powers and a minimum necessary manpower to help carry out their tasks.

(R. K. Mandal)

L-6 : 46

C. R. PATHAK, Instruments of Social and Economic Change in Rural Development, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 79-86.

In this paper a review of such approaches to rural development has been attempted with a view to devise an alternative approach for social and economic development, particularly those based on peoples' participation and decentralization of planning instruments and functions.

Rural development would essentially mean desired positive social and economic change in the rural areas - both in terms of quantity and quality. This concept includes a variety of elements of human life and activities. It also means development of rural areas within the framework of national goals and objectives and without prejudice to the development would include the development of small and medium-sized towns located in the rural hinter-lands in an integrated manner so as to achieve a symbiotic relationship between urban and rural settlements.

The new strategies suggested by study pertain to the establishment of specialized agencies to apply corrective measures and redefine the concept of rural development. The authors suggest that rural poor form the bulk of rural population who are engaged as small and marginal farmers, share-croppers, agricultural labourers, local artisans, and the Scheduled Castes and Scheduled Tribes.

The concept of people's participation lies not only in the plan-making but also in the execution of such plans. The task is difficult nevertheless, it is the only way out.

(R. K. Mandal)

L-7 : 47

A. N. BOSE, People's Participation for Rural Development : Two Antagonistic Prospectives, *Indian Journal of Regional Science*, Vol. XIX, No. 1, 1987, pp. 40-47.

India is not a homogenous entity. There are significant caste and class differences cutting across the gender differences. Some of these differences or contradictions in this class-caste-sex syndrome are reconcilable and some are antagonistic. Because of the inherent differences and contradictions between the class-caste-sex syndrome, the processes of rural development and participation of people therein has been largely affected. These contradictions arise out of historical, social and cultural development.

The focus of an alternative rural development programme suggested by the author lies in the equitable distribution to the tillers of the soil. This is the basis for bringing about development in rural areas. Secondly, organisation of small self-cultivating owners of the land into cooperatives, where they can collectively work for common benefits. Thirdly, in the selection of technology, emphasis should be laid on the backward areas with poor irrigation potential and concentration of oppressed castes and tribes. A technology which can primarily be sustained by local resources and help people in reducing the drudgery of labour, especially those of the women in household, is an urgent necessity.

The controversy between the two alternative paths of rural (and national) development, and hence of two alternative processes of people's participation, is not just an intellectual controversy to be settled between the intellectuals. It is basically a struggle of two antagonistic socio-economic forces within our own society. The settlement of the controversy lies in overall structural transformation in the means and relations of production.

(R. K. Mandal)

M-PROFESSIONAL ISSUES

M : 48

S. M. BHARDWAJ, Towards An Indian Geography Agenda, *The National Geographical Journal of India*, Vol. XXXIII, No. 3, Sept., 1987, pp. 327-34.

In this paper the authors proposes an agenda for India Geography in the light of India's glorious religious and cultural heritage. India, along with other countries formerly dominated by western colonialism, suffers from the contradiction between its pre-colonial economic, social and cultural formations, and the one imposed by its rulers. Its strength lie in the true India characterization of Indian geographic enterprise. Western ideas need not be rejected, rather they can be critically-accepted and tailored to fit into the Indian reality. The Indian geographers should first ask themselves as to how the Indian space is organised, rather than proceeding to determine whether it fits into an improted framework of theory of spatial organization. We should be able to select and determine the suitability of a method or techniques rather than blindly follow the paradigms imported from abroad. Perhaps we cannot get some inspiration from the intellectual dialogues enshrined in the Upanisadas to reassure ourselves that critical thinking was not bestowed upon us for the first time by the occident. At the same time, we have the reponsibility of understanding our own cultural history through educational curricula that recognize such a necessity.

(R. K. Mandal)

P-ENVIRONMENTAL STUDIES

P-2 : 49

H. S. DAULAY AND A. HENRY, Desert Ecological Environments and their Management Systems for Optimizing Crop Plant Production, *The Geographer*, Vol. XXXIV, No. 2, July, 1987, pp. 26, 38.

Analyses the ecological issues related to the crop production in desert environment. It is well known that the low biological activity in the desert areas is the outcome of ecological imbalances created by injudicious use extending over a long time. Any improvement programme, therefore, in view of the author, should take into account the climatic, edaphic, biotic and socio-economic conditions of the system.

In this paper, Rajasthan has been divided into five agro-ecological zones based on mean annual rainfall pattern and then various agro-ecological characteristics of Rajasthan have been examined. Moisture as a limiting factor keeps the growing season limited to 75-80 days and restricts the choice of crops grown in the region. An analysis of 80 years rainfall data indicates that normal and good rainfall years occur in one out of two years with 48 per cent probability. Normal and good rainfall is favourable for double cropping but during prolonged drought conditions (3 to 4 weeks during seedling, flowering and grain formation stages) proper crop management practices are required.

Integrated surveys have revealed that the present landuse is inconsistent with land capability of the region. Only 46 to 60 per cent of the area is suitable for arable farming. Out of it nearly 70 per cent is occupied by sandy and sandy-loam soils which together with poor fertility status, low soil moisture storage capacity and vulnerability to wind erosion constitute foremost problems of soil management for plant production. Soil conservation for improving the desert biome may be achieved by sand dune fixation, proper wind erosion control shelter belts planting and the practice of improved animal husbandry.

The author has suggested the following methods for improved cropland management: (1) Practising efficient rain-water management, (2) adopting suitable tillage and sowing practices, (3) growing efficient crops and varieties matching the rainfall pattern, (4) following intercropping systems and double crop system in good monsoon, (5) growing crops in rotation as a measure of soil fertility management, (6) adopting plant protection methods and (7) practising alternative crop planting during various types of contingencies arising due to erratic, unreliable monsoon.

(M. Farooq Siddiqi)

P-4: 50

SURENDRA SINGH, "Ecological Impact of Irrigation on Biophysical Potentials of Landforms (Ecosystems) of the Rajasthan Desert", *The Geographer*, Vol. XXXIV, No. 2, July, 1987, pp. 39-45.

Rajasthan desert has been classified into 14 major landforms (ecosystems) created by endogenic and climatically controlled exogenic processes. The biophysical potential of these landforms has lately been altered owing to the introduction of surface and

ground-water irrigation. The author has discussed the positive and negative effects of irrigation on various ecosystems of the region. The changes were identified by interpreting aerial photographs and landsat imageries of the area.

The positive effects of irrigation were noticed in the form of improvement of microclimates, aeolian activities and soil moisture regime and in changes brought about on landuse cropping pattern, crop yield and socio-economic conditions of the people.

The negative effects of irrigation are of long duration and pertain to increased salinity/alkalinity hazards, marshy and waterlogged condition, impeded drainage situation and depletion of fertility and productivity of land.

The author has suggested some ameliorative measures to reclaim the desertified land and to check negative effects of irrigation in future.

(M. Farooq Siddiqi)

S-CLIMATOLOGY

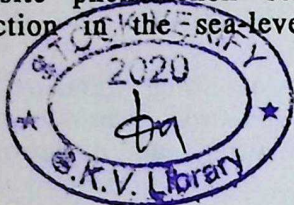
S-2: 51

S. DHANLAKSHMI AND M. HARIKRISHNA, Effect of Storms on Sea Levels at Visakhapatnam, *Deccan Geographer*, Vol. XXV, No. 1, January-June, 1987, pp. 115-20. 1 Map, 4 Diagrams.

This article analyses the paths of four cyclonic systems and their effect on sea-level. Two of them originate north of Visakhapatnam and two of them originate south of it. The onshore winds associated with these two storms encourage piling up of waters along the coasts giving rise to positive anomaly. The anomalies associated with low-water and high-water are shown for each storm. The influence of the wind on the sea surface at high-water time is much more than that at low-water time. So the anomaly associated with high-water regime is greater in magnitude than that with low-water.

The low pressure systems located north of Visakhapatnam, show negative anomalies. The duration of the anomaly persists during the period of storm, the maximum anomaly coinciding with the system approaching the coast. The anomaly associated with low-water is more in magnitude than that with the high-water.

Winds prevail in the vicinity of these low pressure systems with their magnitudes dependent on the pressure gradient which move anti-clockwise with respect to the centre of the system. When the system lies to the south of the latitude, the associated winds provide a coast paralleled component which encourages sinking of warm, waters along the coasts giving rise to increasing sea-level, when the system lies in the north of the observing station latitude the opposite phenomenon occurs resulting in upwelling. This promotes reduction in the sea-level.



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W- METHODS

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P. C. VATS, Application of Remote Sensing Techniques in Geomorphological Investigation - A Case Study of Pali Distict, Western Rajasthan, *The Deccan Geogrpher*, Vol. XXV, No. 1, January-June, 1987, pp. 139-50, 1 Table, 1 Map.

In this paper an attempt has been made to study the landforms through scientific method i.e. aerial photographs, and landsat imageries. The objective is to rationalise the landuse, soil and water conservation for planning and development of the Pali district.

Prominent landforms were identified and their boundaries delineated. Drianage patterns and saline lands were identified and mapped from the landsat false colour composites.

Sixteen geomorphic units have been identified in the Pali district based on interpretation of the aerial photographs and the Survey of India toposheets and the landsat imageries. The largest unit is the flat older alluvial plains while the saline buried pediment is the smallest. These geomorphic units have different physical potentials and provide a sound base for landuse planning in the development of the Pali district.

(R. K. Mandal)

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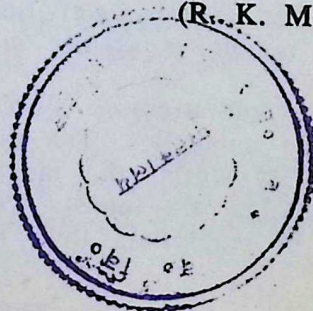
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